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ON CEREBRAL PHYSIOLOGY.

No subject is perhaps of more importance and interest to the anthropologist than the researches which are made in ascertaining the functions of the encephalon. The progress made in cerebral physiology generally, will occasionally come under our review; and the approaching publication of a translation of the works of M. Gratiolet, and of Dr. Louis Büchner's *Kraft und Stoff*, will compel us to examine more minutely what is the exact state of our knowledge on this subject. In the meantime, we present our readers with a sketch of our present knowledge on some of the chief points of cerebral physiology, reserving some critical remarks until a future occasion.

Chemical Composition of the Brain. The investigations of Baron Bibra (*Vergleichende Untersuchungen*, etc., Mannheim, 1856) on the chemical composition of the brain of man and the vertebrata, led to the subjoined results. Bibra had always been of opinion that, though the physiological function of the brain did not altogether depend on its fatty constituent, yet that it was mainly conditioned by it. Experiments supported that opinion. Fat is an integral constituent of the brain, being closely connected with its functions, and does not perform the same office in the brain as in other parts of the organism. Even in diseases producing the greatest emaciation, the fat is not sensibly diminished in the brain. The average quantity of fat in eleven adult brains up to 48, amounted to 14·44 per cent. The medulla oblongata always contained most, the *thalami optici* and the *corpora striata* contained least fat. The average quantity of fat in six brains of very old men was but 13·13 per cent. Average quantity of water, 75·66 per cent. Generally speaking, those parts which have most fat have least water, and *vice versâ*. The average of the

solid albuminous part amounted to 10·83 per cent., somewhat more than in young individuals, in whom it was 10·09 per cent.

From the circumstance that, after any laborious mental exertion, there are frequently found in the urine large quantities of phosphatic salts, coupled with the alleged fact that in the brain of the adult idiot the quantity of phosphorus is not larger than in the brain of a child, it has been inferred that phosphorus plays some important part in the substance of the brain and its psychical manifestations.

With regard to the quantity of phosphorus contained in the cerebral fat, Bibra arrived at the following results: That the quantity is nearly equal in man, mammal, and bird; that it neither is above the average in the brains of lunatics, nor does it vary much in advanced age. There is, however, more phosphorus in the grey than in the white substance. The quantity of phosphorus seems to depend on the quantity of cerebral fat. Bibra does not think that the quantity of phosphorus is relative to greater or lesser intelligence; though it is certain that the brains of higher animals contain a larger amount of fatty matter, and consequently a larger quantity of phosphorus. The fat has, no doubt, a physiological function as a whole; but it does not follow that the phosphorus specially influences the brain in its intellectual function.

It has been already stated, that the diminution of fat caused by wasting diseases in other parts of the organism does not extend to the brain. Fattening of animals does not increase the amount of cerebral fat. The human brain contains more fat than that of mammals, and the brain of mammals more than the brain of birds. The quantity of cerebral fat is rather less in old than in healthy adult individuals. The brains of mammals cannot be said to contain more water than the human brain; it seems that the lesser quantity of fat is replaced by a larger amount albuminous substance. The brain of birds contains a larger amount of water than that of man and mammals.

Cerebral Circulation. Considering that the brain is not merely the organ of the mind, but the source of energy of a considerable portion of the body, and consequently itself subject to great wear and tear, we might *à priori* assume that a large supply of arterial blood was requisite for its nutrition. And such is actually the case; for this supply is estimated at not less than one-fourth of the whole quantity of blood in the body, which reaches the cranium by four independent channels, derived from the chief trunk of the aorta, namely, the carotids and the vertebral arteries. The force with which the blood

is propelled by the left ventricle, may be estimated when we know that after decapitation the blood is projected from the carotids to a distance of five or six feet. But so delicate is the structure of the encephalon, that a circulation through the nervous tissue, in the mode as carried on in other organs, would be incompatible with its functions; hence the division of the large arterial trunks before they enter the brain.

Until a recent period, there prevailed an opinion that the quantity of blood within the cranium was constantly the same. The chief argument in favour of this theory was, that the cranium is a closed hollow sphere, with unyielding walls, filled with fluid. But the cranium is neither altogether unyielding, nor a closed cavity, being, as now proved, connected with the cavity of the spinal canal. Besides this, the cranial cavity is not filled by a simple incompressible fluid, but in addition to the brain by a watery liquid, the quantity of which is subject to constant changes, owing to resorption or secretion, and to afflux or reflux between cranium and spinal canal. Owing to this, and a variety of other circumstances, an expansion or contraction of the cerebral blood-vessels, and consequently an increase or diminution of blood within the cranium, is not merely possible, but must actually occur.

Cerebro-Spinal Fluid. Physiologists differ as to the importance and functions of this substance. Some have considered it as a *post mortem* phenomenon. This is now proved an error, as experiments on animals have abundantly shewn. Magendie, who was one of the first who called attention to this fluid, estimated its average quantity in the adult subject at sixty-two grammes; which Dr. J. Williams (*Lancet*, 1860) considers much below the average. "The clear fluid," observes Dr. Williams, "which sometimes escapes from the ear and nose in cranial fractures, is now proved to be the cerebro-spinal fluid." According to Magendie, the evacuation of this fluid very frequently plunges even the most vigorous animal into a state of complete inertia; and that any change in the quantity or quality of that substance produces well-marked disturbance in the animal economy.

According to Ecker (*Physiologische Untersuchungen, etc.—Physiological Researches in the Cerebro-Spinal Fluid*, 1843), the cerebro-spinal liquid is in constant motion, especially during inspiration. It is accumulated between the arachnoidea and the pia mater; it flows during inspiration into the fourth ventricle, and then through the *aquæductus Sylvii* into the third and the two lateral ventricles. This fluid has been found in considerable quantity in the section of para-

lytics. It cannot *à priori* be denied that its accumulation in the ventricles may disturb motion. "Perhaps," observes Ecker, "it is owing less to the increase in the ventricles than to its simultaneous diminution in the other parts of the periphery of the hemispheres of the brain and cerebellum. Removal of this fluid in animals by an aperture between the atlas and skull made animals lose their equilibrium; spasms and tremors occurred in the extremities; all which phenomena disappeared on the renewal of the liquid. It is clear, therefore, that the cerebro-spinal liquid is not merely a conservative provision, but influences both physical and psychical phenomena." The pia mater seems evidently the organ which secretes it from the blood on the surface of the nervous centres, and it then passes, by a mechanism unknown to us, into the cavities of the brain. Salt, introduced into the current of the circulation, a portion of the substance is soon found in cerebro-spinal fluid. In an inquest on Sam. Page, who died from excess of spirituous liquors, Dr. Bradley of Boston (U. S.) found on dissection a strong alcoholic odour in the fluid in the ventricles, recognized by every one of the jury. (*Amer. Jour. of Med. Science.*) The cerebro-spinal fluid favours the movements of the brain, and prevents any friction of so tender a body as the nervous pulp against the parietes surrounding it.

The long-pending question about the existence of a central canal in the spinal cord, and the fact of the intercommunication of the sub-arachnoid spaces, have been set at rest by the anatomical investigations of Luschka (*Die Adergeflechte, etc.—The Venous Plexuses of the Human Brain*, 1855). The spinal canal communicates above with the fourth, or, as Luschka calls it, the ventricle of the cerebellum, which again opens into the sub-arachnoid space through an aperture at the end of the *calamus scriptorius*.

The celebrated German physiologist T. Ch. Reil, in whose works many of the germs of apparently recent physiological discoveries may be found, had already conceived the plan of an anatomico-physiological comparison of the cerebral structure and mental activity of animals with that of man, with special reference to race, nation, sex, and age, both in the healthy and morbid state. The following invocation, preparatory to his dissecting a human brain, is so characteristic of this enthusiastic physiologist, that we have no hesitation in quoting it. "Direct my hand, Erato! that I may gently open the shell which covers the noblest production of creation. Arm my eye with acuteness, that it may intelligently examine the Dædalus of organization, which is the birthplace of history, the cradle of art, and

the mysterious bridal couch upon which body and soul, the gods of light and the children of nature, carry on their orgies." We may, indeed, safely say that a more complex and marvellous apparatus than the human brain is not to be found in nature. Its delicacy is so great, that six millions of its component microscopic filaments may be packed within a square inch; and yet, how wonderfully are the nervous fibrils interwoven! Will this labyrinth ever be displayed before the eyes of the investigator, like the works in a skeleton clock?

"We find in the brain," says Huschke,* "hills and dales, bridges and aqueducts, beams and vaults, hooks, claws, ammon horns, trees, sheaves, harps, and tuning-forks. No one has yet explained the signification of these singular forms; and centuries may yet elapse before a Copernicus appears,† who may be able to regulate the solar and planetary tracts of our psychical organism."

No one at the present day denies that the nervous system connects all parts of the organism; and that the central organs, and specially the brain, are more or less concerned in psychical phenomena. The great object of cerebral physiology is, therefore, to trace this connection, or, at any rate, to find out how far the mental phenomena are the results or the concomitants of the nervous mechanism; and possibly to deduce some general principles, applicable not merely to the individual nature of man, but to humanity at large.

What are the changes produced by external impressions on the peripheral nerves, and how do they cause perception in some parts of the nervous centre? and how again are, from this centre, the motions determined? Where is the transition from the material impression to the spiritual conception? All attempted solutions leave us in the dark on this perplexing subject. We know the beginning and the end, but the connecting link is as yet hidden from us. The late Sir W. Hamilton, certainly the greatest polyhistor among recent British metaphysicians, considers the various hypotheses held by philosophers relating to the intercourse between mind and body, such as the system of assistance; the pre-established harmony; the theory of a plastic medium, which, partaking of the two natures of body and mind, can act upon both; and, finally, the theory of physical causes, as unphilosophical, simply because of their attempting to establish something beyond the sphere of observation; and he dismisses the subject in the following terms: "The sum of our knowledge of the connection

* Schädel, Hirn, und Seele (Brain, Skull, and Soul). Jena: 1854.

† Pourquoi l'histoire naturelle n'aurait-elle pas aussi un jour son Newton? Cuvier, Diss. Prél. Rev., p. 4.

of mind and body is, therefore, this—that the mental modifications are dependent on certain corporeal conditions; but of the nature of these conditions we know nothing."

All this may be very true. The connection of body and soul is as yet a sealed book; still, science need not give up discussing this or any other question concerning the nature of man. Who can deny the possibility of science ultimately succeeding to trace and establish the laws governing our psychical life, in its connection with the physical organism? or are we to suppose that the connection is not subject to immutable laws like purely physical phenomena? The progress in this direction, and of cerebral physiology in general, has been necessarily slow; still, there has been a progress. The researches of Du Bois Reymond, Matteucci, Brown-Séquard, and other experimentalists, have at any rate made us better acquainted with the physical condition and mechanism of the nervous system. And this is a real progress; for we must first be better acquainted with the corporeal structure, before we can attempt to explain its connection with psychical phenomena.

Willis, who justly may be called the father of modern cerebral physiology, wrote thus in 1683 (*Discourses on the Souls of Brutes*): "Though we can discern nothing with our eyes, or feel with our hands what passes within the secret chamber of the brain, yet may we, by rationally comparing the effects with the working of the machine, at least conjecture what kind of functions are performed in some parts of the head."

Function of Convolutions. Both anatomy and physiology lead to the inference that the convolutions, especially the vesicular grey matter which envelopes them, are connected with the functions of the mind, so that they have been called the intellectual centres. Whether certain convolutions possess those special functions assigned to them by the phrenologists is a different question altogether. A mere alteration of the vesicular grey surface is capable of producing mental disturbance. These convolutions are, according to R. Wagner, already developed in their main proportions about the eighth month; so that the brain of an infant at birth has the principal convolutions as perfect as the brain of an octogenarian. The convolutions differ greatly in individuals; in some they are very complex, and in others poor. The greatest differences occur in the convolutions of the frontal lobes. There are adult brains, which in their disposition resemble that of the fœtus in the seventh month. The frontal convolutions are less developed in the female brain. There are, however, male brains possess-

ing a female type, and *vice versâ*. In most cases of great development of the frontal convolutions, those of the other lobes are equally so. Rich and complicated convolutions are generally considered as concomitants of intellectual power. Most brains of distinguished individuals have exhibited such a structure. The question is, however, far from being settled; inasmuch as in other brains of great thinkers, the convolutions seemed but little complicated. Instances of this kind are cited by Wagner in his latest researches on the functions of the nervous system.*

And here we cannot omit mentioning the remarkable fact, that the brain, at least a considerable portion of it, the very organ which, so to say, converts the impressions into sensations, and would from its delicate texture be *à priori* supposed to be gifted with the highest degree of sensitiveness, is itself insensible; so that it may be sliced off without the animal evincing any feeling of pain. Just as there have been soldiers who have carried bullets imbedded in the substance of the heart, so have there been who have carried bullets in the brain without immediate fatal results; nor have they been much inconvenienced by pain, as proved by the following cases.

William Roberts, surgeon, in Carnarvon, Wales, reported the following case in the *Lancet*:—"Griffith Jones, still living in a small farm on the lakes of Llanberis, lost his eyes by an explosion of gunpowder, in a quarry; a hole was made above the inner canthus of the eye, in the frontal bone, from which a quantity of brain escaped, Mr. Roberts states that he moved the director in every direction, even straight to the cerebellum. Yet the man felt nothing, and completely recovered, with his intellectual faculties unimpaired."

Dr. Badeley (Lumleian Lectures) quotes the case of a boy, who, on a portion of his brain coming away through a fissure in the skull, consequent on violent injury, earnestly requested that it might be sent to his schoolmaster, who had often asserted "that he had no brains."

The following case, brought before the Medical Society of Ghent, is still more curious, for it is gravely stated that the loss of cerebral substance *improved* the intellect. A young man in Ghent lost by a pistol shot two teacups full of brain, and more at subsequent dressings. He lived for two years, with his intellect vastly improved, having before been of limited intelligence.

Paroisse (*Opuscules de Chirurgie*, Paris, 1806) received after the battle of Landrecies, in the hospital at Soissons twenty-two wounded soldiers. In all of them a considerable portion of the cranium, in-

* Gottinger, Abhandl. Vorstudien, 1861.

teguments, and brain, had been cleanly cut off in battle, by sharp swords. All of them marched with their wounds thirty-five leagues, about five leagues per day, to the hospital. Ten of these soldiers, in whom the loss of bone, integument and brain was less, recovered completely within six or seven weeks. The remaining twelve were carried off in about three weeks. In none of these were the intellectual faculties much disturbed.

Doubleness of the Brain, and alleged Duality of the Mind. Some eighteen years ago, Dr. R. Wigan published an ingenious little work, in which he endeavoured to prove that each hemisphere is in fact a separate brain, and not only capable of a distinct process of ratiocination, which may or may not be carried on simultaneously in both hemispheres, but that each brain is capable of a distinct volition, thus establishing what he terms "the duality of the mind." The doctor further lays down that in a healthy encephalon one of the brains is almost always superior to its fellow, and thus capable of controlling its vagaries in thought, and preventing its volitions from passing into acts. He appeals to the experience of most persons of being at times conscious of two opposite volitions, so that it has given rise to the ideas of being possessed by a good or evil genius. This is, however, merely the war which the two brains carry on against each other, the stronger brain of course gets the victory. Hence it may be explained why in some cases patients subject to hallucinations are at the same time conscious that they see only phantasmata. It may then be assumed that one hemisphere is in a morbid state, whilst its fellow is in a healthy condition; in other words, one brain is mad, and the other brain is sane. Considering that the destruction of one hemisphere does not necessarily involve the abolition of thought, nor any decisive impairment of the principal intellectual faculties, it certainly seems no exaggeration in maintaining that we have two brains for thinking, as we have two eyes for seeing, and two ears for hearing. But here the following curious questions arise. Do we use both brains at all times, or do we on common occasions use only one hemisphere, as we use only one hand in writing and other handy work? May not the two hemispheres be in a state of alternate activity, so that one hemisphere is torpid whilst its fellow is wide awake? The curious cases of spontaneous somnambulism, in which persons so affected are said to possess "double consciousness" (a term, by the way, very objectionable), that is to say they forget entirely in one state all that has passed in a previous condition, give some countenance to this alternate condition of the two brains. Some

have suggested that we only use the two brains when we closely fix our attention on some subject before the mind. Have we the power of suspending the action of one brain whilst we are using its fellow? Such are a few of the speculations to which the duplicity of the brain has given rise.

Huschke, speaking of the corpus callosum, which unites the two hemispheres, says, the larger the commissure the more developed are generally the mental qualities of animals. Men with short or thin commissures are of limited understanding. If the commissure degenerates from disease they lose their memory, or may become idiotic. Treviranus considered the large commissure as the organ of memory, and others as the seat of the soul.

Neither Huschke nor the other authors give any reason for their opinions. Now, without considering the *corpus callosum* the particular seat of any mental faculty, we may fairly assume that upon its perfect integrity depends the combined action of the two hemispheres. Hence we can readily believe that individuals, in whom this commissure is largely developed, can bring the two brains into synergetic action; they can concentrate their thoughts upon any subject before the mind. This power is perhaps the most important element in the faculty of memory. Hence Treviranus was only wrong in calling the commissure the seat of memory, its action being seemingly mechanical. The power of fixing our attention begins to fail when one hemisphere, or may be the corpus callosum becomes impaired. But though we may admit that each hemisphere or brain is an independent organ of thought, it does not follow, as Dr. Wigan assumes, that the mind is dual, or that a separate mind resides in each brain. No doubt there are moments when we seemingly indulge in two different ways of thought, or are apparently impelled by two distinct volitions. This phenomenon is, however, explicable, by the rapidity with which both thoughts and volitions succeed each other, so that we imagine them to be synchronous.

Unconscious Cerebration. Every person, no matter whether or not he pays any attention to his mental process, must have made the observation that he sometimes meets in the street some individuals, who seem perfectly familiar to him, and yet he cannot for the life of him either recollect their names or the circumstances under which he met them. He taxes his memory in vain, until in despair he gives up the task. When lo! after some time all the circumstances appear of a sudden before his mind's eye, though his attention in the interval had apparently been engrossed with some other subject utterly

unconnected with that in question. This applies also to more complicated mental operations. Sir B. Brodie *(Psychological Inquiries)* alludes to this subject in the following terms:—"It has often happened to me to have been occupied by a particular subject of inquiry; to have accumulated a store of facts connected with it; but to have been unable to proceed farther. Then, after an interval of time, without any addition to my stock of knowledge, I have found the obscurity and confusion cleared away; the facts seemed to have settled themselves in the right places."

Dr. Carpenter *(Human Physiology*, 608-9), in treating of this phenomenon, observes:—"The entirely new development which the subject is frequently found to have undergone, when we return to it after a considerable interval, cannot be reasonably explained in any other mode than by attributing it to the immediate activity of the cerebrum, which has in this instance automatically evolved the results, without our consciousness. . . . . It is difficult to find an appropriate name for this class of operation. They can scarcely be designated as reasoning processes, since 'unconscious reasoning' is a contradiction in terms. The designation '*unconscious cerebration*' is perhaps less objectionable than any other."

In the dialogue between Mephistopheles and Wagner (see Göthe's *Faust*) the inquisitive student is strongly advised "to stick to words." But, says the anxious scholar, "there must be a notion attached to the word." Meph. "To be sure there ought; but you must not be too nice about that; for just where our notions are wanting a word will help us out." Now, with all due deference to Dr. Carpenter, we must confess that "*unconscious cerebration*" seems to us an expression utterly devoid of any meaning. We apprehend that in a "cerebration" there must be something which "cerebrates," and something which is "cerebrated;" but, to use a popular expression, we are at a loss to conceive "which is which." But was there really any necessity for coining a new term for that mental process by which the automatic action of the brain, apparently without our knowledge, selects, aggregates, and eliminates facts and events? We think not. To be sure, the assumption of the automatism of the brain smacks somewhat of sensualism,—the modern name for materialism,—which broadly assumes that just as it is the function of the liver to secrete bile, and of the lachrymal gland to secrete tears, so it is the function of the brain to secrete thoughts. But whether we assume that the process is effected by the mind acting on and through the brain, or that the

latter acts automatically, the psychical phenomenon of a train of ideas being unconsciously evolved, once the impulse being given by a sensation or an idea, must be admitted as an ultimate fact, explain it as we may. These phenomena appear to us to pertain altogether to the law of association, which extends to all of our ideas, sensual, intellectual, emotional, and volitional. By association, under the laws of resemblance and contiguity in time and place, our ideas are regulated, linked together, and may be called up together. It has been said that it is to the mind what the law of attraction is to matter, drawing together ideas connected by affinities, and repelling others that cannot coalesce. The greatest confusion would prevail in our minds; our memory would be a lumber room, not a store house, were there not a fundamental principle at work which introduces some order among the myriads of our ideas. It is an automatic process not necessarily attended by consciousness. It is independent of our will; for though we have, in the waking state, considerable control over our association, we cannot altogether emancipate ourselves from its direction. Ideas which we would rather discard *will* start up, in spite of our efforts to suppress them.

And may we not, since it is permissible to theorize, in the absence of positive data, explain the spoken of psychical process in this way, viz., that whilst we use one hemisphere or one brain, in the elaboration of a fresh subject of thought, we leave the other brain to its own automatic action, that is to the association of ideas, in the evolution of which it will sometimes succeed more effectually when let alone than by the interference of the will, for it is frequently this very interference which defeats our object.

The Cerebellum. This organ is anatomically so distinct from the cerebrum, with which it is but slenderly connected at the base, that one would think that there could be no difficulty in assigning to it a special function; yet even here the theories are conflicting. There are comparatively few authors who have assigned to the little brain any participation in the higher psychical manifestations. Amongst modern physiologists we may mention Carus, who considers it as the seat of the will and desires; whilst Jessen deems it as the special organ of the emotions. Dugés *(Traité de Physiologie)* thought it was an organ of the perception of taste and hearing. Gall again, and his followers considered the cerebellum as the exclusive seat of sexual desire. Rolando looked upon the cerebellum as the central source of all voluntary motion. Magendie thought that this organ impels the animal forward, and thus was the antagonist of the *corpora*

striata, which induce the animal to retrograde. Flourens, Hertwig, and other experimentalists, only looked upon the cerebellum not as the source, but as the regulator of voluntary motions, inasmuch as animals deprived of this organ are still able to move, but cannot maintain their equilibrium. This theory of considering the cerebellum as the co-ordinator of voluntary movements, which had received the assent of most physiologists, is again contested by several eminent authors.

Brown-Séquard also denies that the guiding power has its seat in the cerebellum. "I have ascertained, he observes, that by the irritation they produce on various parts of the basis of the encephalon, that the diseases of the cerebellum or its extirpation in animals cause the disorder of movements, which has been considered as depending upon the absence of a guiding power. In fact the least irritation of several parts of the encephalon, with only the point of a needle, may generate very nearly the same disorder of movements that follows the extirpation of the cerebellum. I have been led to conclude that after this extirpation, or after the destruction by disease of a large or small part of this nervous centre, it is not its absence, but some irritative influence upon the parts of the encephalon that remain unaltered which causes the irregularity of movement."

"The cause of the co-ordination of muscular movements is" (says Schroeder van der Kolk) "situated in the spinal cord, and it has always been incomprehensible to me how any one could ever have referred it to the cerebellum. If the cause of co-ordination lay in the cerebellum no harmonized reflex movements could take place in a decapitated frog. . . . . If the cerebellum were the seat of co-ordination, irregular movements would of necessity ensue, on an irritation of that organ. But in ulceration of the cerebellum, when the irritation is more chronic and not so violent, I have never seen irregular movements arise."

No wonder that the most recent writer on the physiology of the nervous system, Moritz Schiff, an experimentalist of considerable eminence, has arrived at the conclusion, that for the present, the real functions of the cerebellum are altogether *unknown*.

We have hitherto considered the hemispheres as the sole organ of the mind in man. Doubts have, however, long existed against the generally received opinion that the hemispheres properly so called constitute the only sensorium—the exclusive seat of consciousness. Modern experimenters have, therefore, endeavoured to establish the sensorial functions of certain ganglia in the centre and at the base of the brain; others in the medulla oblongata; and, finally, some in the spinal cord.

"I consider," says Lotze (*Medicinische Psychologie*—Medical Psychology, 1852), "the corpora striata, the optic thalami, the tubercula quadrigemina, the pons, and the cells in their neighbourhood, as that series of organs in which the combination of sensual impression, and the excitation of co-ordinate motion take place, and that these parts may exclusively be considered as the 'organ of the soul.' To ascribe to each of these parts its proper functions we possess no exact data, except the blindness which seems to result from injury to the tubercula quadrigemina, and the disturbed co-ordination of motion, in consequence of the destruction of the optic thalami, and of some parts of the cerebellum. To consider so large an organ as the cerebellum the exclusive seat of sexual desire seems to me an absurd idea. I dissent, therefore, from all such fancies as to place intelligence in the cerebrum, the will in the cerebellum, and the emotions in the mesocephale."

Lotze further thinks that the hemispheres cannot be considered as exclusively the seat of intelligence, inasmuch as large quantities may be lost without interfering with psychical phenomena, and that there are instances on record in which the loss of cerebral substance has, after the cure, rendered the mental operations more active, and the temperament more lively than it was before the loss. He considers, therefore, the hemispheres, specially the cortical portion, as a nutrient organ for the nervous principle of the organs of sense. But though they have no direct influence upon sensation and recollection, the hemispheres may in one aspect be considered as an organ of intelligence, because they determine the force and functional capacity of the nerves, and possess thus a great influence upon the energy of sensation, emotion, and temperament. Dr. Carpenter, as is well known, has long advanced the same theory, giving to the above-mentioned structures the name '*sensory ganglia*', instead of *sensorium commune.*

Thalami Optici. From experiments performed to determine their functions, it seems that these bodies are not, as the name implies, essential to vision, for they have been destroyed without any loss of the power of sight. According to Longet the optic thalami seem to have a crossed action upon the voluntary movements. Destruction of the right thalamus has the effect that the animals fall at once upon the left side, and if the left be destroyed a similar debility is manifested in the right side. The removal of either of these thalami may also produce effects similar to those observed in the division of one crus cerebri, namely, a rotatory motion, the animal turning continually round. The real functions of these bodies are,

however, not satisfactorily proved; nor is this surprising, as they can neither be isolated nor entirely removed, without injuring the adjoining parts.

The terms *tuber annulare* and *pons varolii* are by many anatomists used synonymously; others apply the latter term only to the transverse fibres forming the commissure between the hemisphere of the cerebellum, and tuber annulare to the projection from the surface of the medulla, which contains a considerable quantity of vesicular matter; hence they consider this part as a special centre of sensation and motion. The experiments of Longet and Flourens show that even after complete removal of the encephalon above the medulla in warm-blooded animals, leaving the pons intact, there still remain indications of sensibility and voluntary motion, which cease on the destruction of the tuber annulare. The animal may still be induced to move by external irritation, but these movements seem rather due to reflex action of the spinal cord than to volition. The tuber annulare is, therefore, by some physiologists, considered as an organ by which impressions are conveyed inward, are converted into sensations, and where voluntary impulses originate, stimulating the muscles to contract.

Tubercula Quadrigemina. These are four round eminences, placed in pairs, two in front and two behind. The anterior pair, the nates, are longer than the posterior pair, the testes. Both pair are solid in the adult, and composed of white matter externally, and grey matter internally. That these bodies are closely connected with the sense of sight can be proved by direct experiment. Section at any point of the optic nerves to which they give origin, between the retina and the tubercles, produces complete blindness, whilst injury or destruction of the tubercles themselves produce the same effect. Besides being the nervous centres for the perception of light, a reflex action takes place through them to the iris, to regulate the quantity of light admitted to the eye, by the dilation or contraction of the iris. Dr. Laycock (*Mind and Brain*) dissents from this. "It is far more probable," he observes, "that the tubercula quadrigemina belong to the medulla, and may be considered to be co-ordinating structures for the substrata of the muscles of the special senses, including touch. In the mole, with rudimentary optic nerves, these tubercles are of immense size. This fact is of itself sufficient to disprove the theory as to the functions of these bodies."

Corpora Olivaria. Dugés (*Physiol. Compar.*, 1838,) observed:—"The olivary bodies possess another interest, as nervous centres. It

should be noted that the olivary bodies are more voluminous in man than in any other animal, and that the nerves of the pharynx, larynx, and the tongue issue from the olivary fasciculi, which by the mediation of the hypoglossus thus act on enunciation."

Van der Kolk says:—"Immediately after I had discovered the special fasciculus connecting the corpora olivaria with the nucleus of the hypoglossus I suspected that the very delicate combinations of motions in the human tongue, in articulation and speech, might afford an explanation of the much greater size of the olivary bodies, and of the more intimate connection with the nuclei of the hypoglossus. For speech and the articulation of words require such a multitude of varying combinations of its muscular movements, that it cannot appear strange that two auxiliary ganglia* should be required for the performance of these functions." That the corpora olivaria are organs for the articulation of the voice is no mere conjecture, but confirmed by facts, several of which are cited by him.

From the intimate connection existing between the facial nerve and the olivary bodies, as shown by Retzius (*Müller's Archive*, 1836), the olivary bodies may also be considered as central organs for the mimic expressions in the countenance.

Semicircular Canals. The experiments performed by Flourens on these organs presented the following phenomena:—Section of the horizontal semicircular canal in a pigeon induced a tendency to turn to one side; section of a vertical canal was followed by a violent vertical movement of the head; section of the anterior vertical canal caused the animal to make continued forward "somersaults." Flourens hence concludes that the nerve supplying these canals does not minister to the sense of hearing, but to the direction of the movements of the animal.

In the sitting of the Academie des Sciences, Feb. 17, 1862, Flourens refers to this subject as follows:—"There are but four principal movements in man; from right to left, from left to right, backwards and forwards, each of which corresponds only to the direction of a semicircular canal; the movements from right to left, and from left to right—to the two horizontal canals, one right and the other left. The movement backward to the antero-posterior canal; the movement forward to the antero-anterior canal. These great phenomena, not yet explained, have engaged my attention for thirty years, and I trust I shall succeed in fathoming them."

* The accessory olivary ganglia, discovered by Stilling, appear to be the centres for the process of deglutition.

These experiments, showing that there is a constant relation between the direction of each semicircular canal and the direction of the movement have been repeated by Brown-Séquard, and recently by Czermak; the former concludes that the auditory nerve is a veritable centre. Flourens does not say that the cause of the movement lies in the canals, but lies farther off in the encephalon.

The Pineal Gland, which has derived its name from resembling the cone of a pine, and has, from its central position in the brain, been considered by Descartes as the throne of the soul, has long lost caste, since it was found that the sand contained in it is not merely found in the brains of idiots but in the brain of every adult. Nor is the calcareous substance peculiar to the pineal body, but is found in other parts of the cerebrum, and from its resemblance to starch corpuscules, termed by German physiologists *corpora amylacea*. Indeed by some physiologists the pineal body is not considered to consist of nervous tissue at all, but is like the pituitary body, formerly believed to discharge its excretions through the nostrils, and thus to clear the brain, simply placed among the ductless glands. It is scarcely necessary to state that the functions of these bodies are altogether unknown.

The Medulla Oblongata. "Of all parts of the human body," says Schroeder van der Kolk* (p. 87), "there is not one which is of so great moment to the existence and continuance of life, and to the maintenance of the most different and important functions of the system, uniting in a small space, and, as from a central point, directing so much that is various in aspect and really diverse as the medulla oblongata. . . . . Here is, in fact, the nucleus and the central point, whence most phenomena proceed; *here the seat of perception or sensation seems to lie;* violent pain, by reflex action here, produces groaning; here reflex movements pass over to the other side; here is the centre of automatic respiratory functions and of deglutition; hence the nervus vagus derives its remarkable influence upon the heart; and finally, an irritated condition of this part produces excitation of the sexual organs, and even appears to have some influence on the action of the kidneys. That the medulla oblongata is the seat of perception can scarcely any longer be a subject of doubt. Not only is it known that the brain itself is insensible, but while the nerves of sensation in the spinal cord pass upwards, the trigeminus descends to the medulla oblongata, *that is, to the seat of perception.*" (Page 93.)

* On the Minute Structure and Functions of the Spinal Cord and Medulla Oblongata. Translated by W. D. Moore. London: 1859.

But, strange to say, whilst Van der Kolk considers the medulla as *the* seat of perception and sensation, he invalidates his assumption in his remarks "on shrieking"—"There are, in fact, many involuntary actions, which we ordinarily regard as voluntary; for example, shrieking with pain. This shrieking appears to be merely the effect of a reflex action on the upper part of the spinal cord, or medulla oblongata. . . . . Hence it follows that in vivisections so many incorrect inferences are drawn as to feeling or perception in animals. If the brain is cut off above the pons varolii, and the fifth pair of nerves be strongly stimulated, the animal will cry out, *although without consciousness, without perception, and without feeling of pain.*" (Page 77.)

Here we may well ask, if the medulla, and not the brain, is the seat of sensation, how does it come to pass that the removal of the hemispheres abrogates sensation, though the medulla remains intact? The above fact would rather lead to the inference that the seat of perception is in the hemispheres, and not in the medulla. We simply draw attention to this glaring contradiction, without in any way denying that the medulla may be a centre of sensation and motion, specially in animals possessing no brain, properly so called. But not merely the medulla oblongata, but the spinal cord, properly so called, has been considered as a real sensorium.

Sensorial Functions of the Spinal Cord. Many observations have abundantly proved that animals may feel and will after the removal of the hemispheres. It is also remarkable that this removal does not produce the same effect in all animals. Thus, rabbits and guinea pigs were seen to run about after the operation, and the latter are even said to defend themselves, when irritated.

The clearest proofs of sensation and volition are, however, exhibited by reptiles. "Twenty-four hours," says Volkmann (*Wagner's Handwörterbuch*, i., 579), "after I had removed the large hemispheres from a frog it skipped about in the room, endeavouring to conceal itself behind a chest of drawers, and though pushed back several times with the hand or foot, it always returned. Placed into a pot it did not spring forward, but upwards, as if it saw the aperture. Motions of this kind cannot be called reflex, for such actions an excitation is requisite, which primarily proceeds from the periphery to the centre, and secondarily from the centre to the periphery."

A large alligator, four feet long, being decapitated, the headless trunk, as on many former occasions, performed numerous actions, indicative of volition, sensation, and intelligence. The body curved

in a manner so as to recede from the offending agent, and the limbs were directed so as to remove it. From its actions, far more impressive than words, it was evident that it judged accurately, as to the degree, duration, and place of painful or painless impressions. (*Dr. Dowler on Nervous Action.*)

E. Pflueger* has published a very interesting monograph "on the sensorial functions of the spinal cord," not only in reptiles but in mammals, and also in man. This theory has only received a partial assent from physiologists.

The Vital Knot (point vital, nœud vital). There is a small **V**-shaped spot of grey substance in the medulla oblongata, resulting from its bifurcation, which is by Flourens pointed out as the centre of life, because instant death is the consequence of its destruction.

Dr. Brown-Séquard, however, considered that Flourens has erred, in ascribing this function to this part, inasmuch as the removal of the "nœud vital" does not immediately produce death, nor is voluntary motion and sensation instantly destroyed.

Flourens replies:—"Physiologists have asked me to indicate the precise spot of the 'point vital.'" I answered, "the point vital" is indicated by the **V**-shaped gray substance. They asked me for an external mark, and I gave it. But I never imagined they would take the external mark for the spot itself. It seems, however, that some have committed this mistake; they removed the **V**-shaped grey substance, and were astonished that the animal did not die. The **V**-shaped substance has nothing to do with the "nœud vital," which is situated beneath it. The "nœud vital" is double, as every thing is double in the nervous centres. In order that life should cease, both halves should be divided to an extent of two millimetres and a half each, five millimetres for the two. A transversal section, deep enough, of five millimetres at this given spot, is sufficient to destroy life at once.

From the conflicting opinions entertained by physiologists, in regard to the function of most parts of the encephalon, it cannot but be admitted, that despite of numerous experiments, cerebral physiology is still in its infancy. The most essential requisite is, no doubt, in the first place, a microscopic anatomy of the brain, which is far from being complete; so that Gratiolet, one of the most eminent

* Die Sensorischen Functionen des Rückenmarks. Berlin: 1853. See also G. H. Lewes' Physiology of Common Life, and papers read before the British Association 1858, for the details of a theory generally in accordance with that of Pflüger.

cephalotomists of the day, says—"Let us confess that in our ignorance of the true structure of the medulla, the peduncles, and the optic thalami, the question is abandoned to the speculations of physiologists." How long it may be before cerebral physiology shall acquire a firm basis, and reach that state of perfection which may enable us to solve any of the mooted problems, we cannot at present say. In the mean time, we must continue searching for corporeal parallels to psychical manifestations, and collect all possible information relative to cerebral structure, both of individuals and of the different races of mankind.

SEEMANN ON THE INHABITANTS OF THE FIJI ISLANDS.

By A. A. FRASER, Esq., F.A.S.L.

It is somewhat singular that so long an interval should have occurred between the revelation of the wonders of the Pacific by Captain Cook —its practical discovery in fact—and the occupation, for colonization or commerce, of certain islands and groups of islands, which he proved to contain all those elements which can be welded into wealth and prosperity. It is true that the famous Botany Bay was examined a few years after the great navigator had visited it,—the spot of his landing being marked by a plate and inscription,—but more than half a century from that date passed before the first emigrant ship ran into Queen Charlotte's Sound, New Zealand, with a number of settlers to occupy a country with which Captain Cook was delighted, and which both the Americans and the French thought of colonizing before us.

The aborigines of Australia having familiarized Europeans with their manners and customs, the white rovers soon faced the feared and long-dreaded New Zealander, or Maori, and anchored in his harbours, fished on his coasts, ascended his rivers, and soon boldly ventured on more intimate relations. It was bold spirits who colonized Australia, and the boldest of them who settled amid the can-

nibals of Cook's Straits, and gave the Maori that taste for trade which was the germ of civilization.

Fiji, lying a week's sail to the north of New Zealand, was far less likely to be occupied quickly by Europeans than the latter group. It did not lie on the route of large fleets, its inhabitants were shunned as the most truculent of savage tribes, and its encircling reefs were the dread of the mariner. But, as the whale fishery drew whole fleets of ships to uncolonized New Zealand, so the Bêche-de-Mer and Sandal-wood trade attracted American traders to savage Fiji. In both cases, turbulent seamen from among the traders formed the nucleus of European occupation. The early authentic history of the group is closely connected with the career of one Charles Savage, who was wrecked on one of the islands, and who became quite a powerful chief. It will give some idea of the manner in which a slain enemy was and has been treated by the Fijian, when Wilkes and others state that Savage was killed in a fight, eaten, his bones made into sail-needles, and his skull into a drinking cup.

The group of islands called Fiji, extending over five degrees of longitude and three of latitude, contains over two hundred islands, two of which—Na Viti Levu and Vanua Levu—are, the former ninety, and the latter one hundred and fifteen miles long.* Fiji, from its size, position, and products, has lately occupied a prominent position before the public; and it would appear that our government a short time since were anxious to have it critically examined by competent authorities, with a view to understand its usefulness and value as a colony.

A party was arranged accordingly to examine the group. The result of the visit has been the interesting and reliable work before us, *A Mission to Viti*, by Dr. Seemann, who, in the character of botanist and traveller, has certainly made the most of his time, visiting out-islands, exploring new districts, ascending mountains till then untrodden by Europeans, and discovering entire orders of plants, not a member of which was previously known to the scientific world. All this was done too with the keen relish of an enthusiastic admirer of Nature, and hence the book carries with it an air of freshness and vigour.

We are glad to observe, that, at the outset Dr. Seemann was convinced of the necessity of adhering closely to the authorized form of the Fijian language, he says, "Nothing but endless confusion will be the result if every nation is allowed to write Fijian names according

* Feegeean and English Dictionary, Vicnu, by the Rev. D. Hazlewood.

to its own orthography." Exactly so. And if travellers will be careful to observe the same course they will save themselves much trouble, and get the blessing of those who follow them. For example, "Mudwater" is found to be Macuata, and series of names are recognized after great difficulty only, and all this might be obviated, if travellers would, with Dr. Seemann, get an insight into the character of the language, names from which are to be published to the world. After some puzzling, it was found out that the nondescript name which appears in most maps for the North Island of New Zealand, Eaheinomauwe—as handed down by voyagers—should have been Te-ika-a-Maui.

Many a scrutinizing glance has been cast over Na Viti Levu (big Fiji), and many a bold spirit has longed to explore its rivers, and distant mountains, as voyagers have anchored on its coasts for refreshment or trade. And the curiosity of the traveller has been heightened by the fact, that the only knowledge the tribes on the coast have of the interior is wild rumour. Even at the present date, this large island is for the most part entirely unknown to us; our discoveries being limited to portions of the south-eastern coast, and especially the district of the Wai Levu, or Rewa River.

Up this river went Dr. Seemann, determined to explore as much of the country as possible, his party consisting of Col. Smythe, Mr. Prichard, the Rev. J. Waterhouse, Danford, Chief Kuruduadua, and a host of followers, all embarked in canoes. Away they dash in high spirits, and now Dr. Seemann begins to take advantage of his enviable position as a traveller with a vast field of observation before him. "I thought I could not do better," said he (p. 148), "than take advantage of their local knowledge, and dot down all I heard, saw, and had pointed out." And if these dottings have not the sensational adventures of those travellers who think they ought to be shot, or drowned, or something worse at regular intervals to make their travels worth reading, they have the greater merit of being the careful and critical observations of an old traveller and man of science "upon the wing," as Dr. Burton observes.

Towns, plantations, and varied scenery delighted the eye, as the light canoes with their strange-looking outriggers dash up the river. But then they approach the "hundred waterfalls," and the river becomes a net-work of dashing, foaming rapids. The canoe was dashed away and capsized, and the tea and sugar came to grief, the biscuits becoming a pulpy mass like "bread-and-butter pudding."

The travellers reach the town of Nagadi, and we get a good insight

into the manners and customs of the "Kai Viti." A supper of pork, yams, and taro, was cooked in the native fashion, "all baked on hot stones in true Polynesian style, as Captain Cook described it one hundred years ago." After supper came the grog, in other words, "yaqona" (yanggona), the brewing of which would not probably suit English tastes any more than the liquor itself. Those who may be curious to see the apparatus for brewing kava—as it is commonly called in the Pacific—will find the *et ceteras*, with many other articles worthy of attention brought home by Dr. Seemann, in the museums in Kew Gardens.

One fact is recorded which is worthy of attention, as it explains the reason why Europeans often live amongst the worst savages in perfect safety—a thing not often understood. Dr. Seemann says, that Colonel Smythe discovered one day he had left his purse at the last halting place. "Make yourself perfectly easy about it," said Kuruduadua, when this loss was communicated to him, "I allow no thieving here; I club all thieves; they don't do that at Rewa or Bau." Of course the purse was safe, and would have been safe anywhere, as being the property of a man *under the protection of the chief*. So with individuals as with property; and the exploring party were perfectly safe while under the ægis of this chief, although in a district where human life was little valued, and the natives were confirmed cannibals.

The ethnology of the Fijian branch of the human race is a subject full of interest, of great importance, and, as regards purely scientific and accurate knowledge, but little understood. Various missionaries and members of scientific expeditions have written much upon the manners, customs, and traditions of the Fijians, but they have had no system of anthropological research, by which to guide their researches to a conclusive issue. They have gathered isolated facts, but there has been no centre around which to group them; and, for the present, they are comparatively useless to the ethnologist. Let us take the views of Dr. Prichard* upon this point. After a very short discussion, he insists that "the Polynesian nations, though belonging to a different physical type, are, nevertheless, genuine descendants, or really cognate tribes of the Malayan family." And this, upon all but circumstantial evidence—easy communication from island to island, slight affinity between the Malayan and Fijian languages, etc. But who has attempted to prove this from evidence such as the islands themselves might offer? We

* Natural History of Man, vol. ii, p. 436.

do not wish to impugn a sensible hypothesis, but we would rather have a proved fact, as a basis of argument, than an hypothesis.

Dr. Prichard—to show how he arrives at conclusions—quotes Crozet, dividing the New Zealanders into white, brown, and black people; and adds, "the latter are of smaller stature than the former, but there is no clear indication of their belonging, as some have conjectured, to a different stock." Was the latter assertion founded on such ascertained facts as scientific men like to use? Decidedly not. The Rev. T. Taylor, for many years Church missionary at Cook's Straits, a philologist and naturalist of considerable experience, distinctly states,* after long observation, that the Maories "are decidedly a mixed race." And the natives themselves have traditions of a strange race, included in their mythology, which may, for aught we know, *with certainty*, refer either to some found in the island of New Zealand, when they emigrated thither, or to others of a different race, who have arrived since, and have become fused into the Maori family. The actual fact is generally denied; but who has proved, upon irrefragable evidence, that the Maoris have a common origin, and that they found the large fertile islands of New Zealand uninhabited, when they reached them from the North? No one.

After quoting evidence referring to the Tonguese, viz., "the natural colour, I believe, almost without exception, is black; but some stain it brown, purple, or of an orange cast"; which is totally† incorrect, Dr. Prichard (vol. ii., p. 477) agrees with M. Lesson, "that the Polynesian race had peopled the distant groups in the great Pacific before the progress of the Pelagian negroes, in a similar direction, took place;" and yet, we contend, that the light Polynesian race are the conquerors in the Pacific. But after making general conclusions upon the races of the Pacific, he says, very naïvely, "we have not yet sufficient information respecting the Viti islanders to afford any conclusive evidence on this subject." Dr. Seemann's observations on the people are pertinent and correct; and from what crops out, here and there, we believe had not his labours been specially directed to the "flora" of Fiji, as the botanist of the mission, we should have had a mass of ethnological evidence derived from observation, founded on fact, and arranged and pushed to legitimate conclusions on vexed points.

We do not remember seeing any where else so clear and phi-

* See Te ika-a-Maui, p. 184; also his belief of Chinese or Japanese having settled here, and of a Chinese bell found at Wangarei in 1839.

† See Dr. Seemann's evidence, Viti, p. 236.

losophical an argument upon the nature of cannibalism—upon which so much misapprehension exists—as the following (p. 181): "Fijians always regarded eating a man as the very acme of revenge, and to this day the greatest insult one can offer is to say to a person 'I will eat you.' In any transaction where the national honour had to be avenged, it was incumbent upon the king and principal chiefs—in fact, a duty they owed to their exalted station—to avenge the insult offered to the country by eating the perpetrators of it. *I am convinced, however, that there was a religious, as well as a political aspect of this custom, which awaits future investigation.* . . . . . There is a certain degree of religious awe associated with cannibalism where a national institution, a mysterious hallow akin to a sacrifice to a supreme being, with which only the select few, the tabu class, the priests, chiefs, and higher orders, were deemed fit to be connected."

We must here insist upon the fact that cannibalism has been, and still is, to a less extent, not only a custom, but an *institution*, entering deeply into, or rather having been formed out of the several elements of Fijian character, and moulded into a semi-religious, semi-social instrument, whereby:—

1. Reparation was to be afforded, for insult, injury, etc.
2. The gods were to be propitiated, as by a kind of sacrifice.
3. The most complete revenge could be obtained, doing justice to the wronged, and giving pleasure to the gods as well.

The perusal of this book alone will satisfy all, as to the prevalence of the *institution*. The drum beats,—that horrid wooden drum,—and the natives rush out to see the victim. "He* is stripped naked, struck down with the club, his body ignominiously dashed against a stone, *in front of a temple*, and then the body is cut up, and *divided amongst a chosen few*, ere the vital spark is extinct. Sometimes he is dashed into an oven, whilst yet alive, and half frizzled. The little children run off with the head, and play with it, as you would with a cricket ball."

A mass of evidence could easily be furnished, to prove that cannibalism in Fiji was not only an institution, but one, sad to say, extensive in its operations. One instance; in 1841, Ratu Varani, a chief of power, in Viwa—who, with his own hand clubbed the captain of "l'Aimable Joséphine," a French brig, and took the vessel†—led one hundred and forty Macoëans into an ambush, and "in‡ the

* "Vah-ta-ah", p. 30, Introduction. By Rev. J. Waterhouse.
† L'Univers Pittoresque. Paris: 1837.
‡ Notes in the Memoir of the Rev. W. Cross, p. 199, et seq.

space of a few minutes about one hundred of them were massacred. A few were shot, others were cut to pieces with hatchets; others had their brains dashed out with the fearful clubs of 'these horrible dogs of war.' Only a few of the number were saved, and *the rest were taken to Bau, cooked, and eaten.*"

Some writers, betrayed by appearances, have imagined that scarcity of food was the real cause of anthropophagism in the Pacific; but the ground of this argument is taken away as regards Fiji, when we consider that, notwithstanding the islands do not produce but a fraction of what they might, yet enormous feasts are of constant occurrence; and furnishing fresh provisions to whalers and others has long been a source of profitable barter, and this often on a large scale.

As a matter of course, there would be many among the rude savages of the Pacific in whom the horrid practice of eating their victims ended in a morbid relish for such food; and out of much information on the point, we are willing to rely upon the authority of Dr. Seemann, as given at p. 174, et seq. The views of the French navigator, Dumont D'Urville, resting upon evidence gained on the spot, are so pertinent to this subject that we cannot forbear quoting them:—"Ceci démontre que les préjugés superstitieux, et les plaisirs de la vengeance, dirigent ces sauvages dans leurs festins barbares bien plus encore que les simples besoins de l'appétit physique. A cet égard, nous partageons complétement les idées de Forster, Savage, Nicholas, Marsden, Kendall, etc."*

Dr. Seemann touches upon the question of the spread of the light coloured race over the Pacific, and its subjugation of the black (p. 236, et seq.); and we have a few judicious remarks, which are worthy of the attention of ethno-anthropologists. He says, "Ethnologists have long been watching the spread of the Tonguese over the South Sea, and Viti has become a field of high interest, as the light-coloured Tonguese, a genuine Polynesian people, have here met face to face powerful representatives of the dark-coloured Papuan race." And, speaking of the two races—Tongans and Fijians—observes, "the Tonguese, or Friendly Islanders, may well be called the flower of the Polynesian race. . . . . They are tall men, with fine intelligent features, dark, often curly, hair, and of a light-brown complexion." It is also stated, "they are far beyond the Fijians, in good looks." Commander Wilkes' evidence is similar; and he adds, "it was pleasant to look upon the Tonguese, but I felt more

* Voyage de l'Astrolabe. Paris: 1830. Tom. ii, p. 547.

interest in the Fijis." Using the word race to mean such a branch of the great human family, as is readily distinguishable, by marked peculiarities of physical structure and language, it would appear that the dark men of the Pacific—to whom the Fijians belong—are inimical to the light race, and that the latter, being more powerful and warlike, tend towards the subjugation of the former. Here, again, there seem to be several points of the deepest interest, which, not being settled by rational deduction from ascertained facts, leave the question of race, its limits, variations, etc., in great confusion. Admitting, with Dr. Prichard and M. Lesson, that the Malay race spread from west to east, and that the distant groups in the great Pacific had been peopled "before the progress of the Pelagian negroes, *in a similar direction*"—in other words, that the light-coloured race spread somehow over the Pacific, and were succeeded by the dark Malays—we are forced to inquire, whence came the light Polynesians? They are commonly spoken of as springing from the Samoan group, and they might have arrived there from the clouds, for what evidence we have gained to the contrary; in fact we believe it would suit the arguments of some to give them such an origin, because it simplifies matters to tell us that the inferior race spread over the Pacific till they were met by the superior celestials, who were and are bound "westward ho!" If the two races of population set in the same direction, how could the weak supplant the strong? and the conquered race, by some sudden, unexplained cause, turn conquerors? And yet Dr. Prichard is vexed with Mr. Crawfurd, for not accepting his conclusions.* Space will not permit us to go deeply into the question, but, if we have started questions which are commonly supposed to have been clearly answered, it is because, from personal experience, we are surprised at the grand theories built upon such slight evidence, and astonished, that while our scientific expeditions are despatched to investigate the botany and zoology of distant and little-known regions, by attentive observation and research on the spot, the most superficial attention is given to those points relating to anthropology, upon which, we think, more depends than upon philological notes, and second-hand information. The Novara expedition is an exception to this rule to some extent.

Dr. Seemann, "more than half a tree worshiper," is at home among the products of the Fiji group, and we have his authority as to some of the vegetable wonders of these islands. Here are palms, useful and ornamental; fruits in profusion; shaddocks, guayava, custard-apples,

* Natural History of Man, vol. ii, p. 428.

plantains, and bananas, weighing from 50 to 80lbs. a bunch; and as to yams, "specimens eight feet long, and weighing 100lbs., are by no means rare in the group." The islands contain also fine timber, some of the Dammara pines rivalling those of New Zealand, in size. Here also are the iron wood and paper mulberry trees; the former being handy for clubs, etc., and the bark of the latter to make the native clothing. Passing these, and numerous others, we must notice that trade is carried on in arrowroot, tortoise-shell, oil, provisions, and articles of native fabrication. As regards the growth of cotton, which is just now a matter of importance, Dr. Seemann states, "if I understand the nature and requirements of cotton aright, the Fijis seem to be as if made for it . . . . . in fine, every condition required to favour the growth of this imporant production seems to be provided." Surely this will be a cotton-growing group, and if not so serviceable to England, will feed the Manchesters of Australia. And we shall be surprised if the general, as well as the scientific reader, does not find himself interested in the rich and beautiful Flora of Fiji, as described in so pleasing a style.

All those who have had the opportunity of visiting a large Chinese city, or seaport, have noticed baskets of black-looking substances, like pieces of charred leather—and something similar is trepang, or bêche-de-mer, of which the celestials make "a very rich and palatable soup and dress it in different kinds of stews." This* bêche-de-mer—an echinoderm—is found in large quantities upon the reefs in Fiji, and Dr. Seemann gives us a notice of the character of the trade, and to what an extent the people depended upon it for barter. The Americans seem to have monopolized the trade, and, as "a whole cargo which cost 1200 dollars" has been sold for 12,000 dollars, they make fortunes occasionally by it. In the historical remarks, at p. 405, *et seq.*, we have some interesting particulars respecting the early traders in this "sea-slug" and sandalwood—the former referring to the tastes, the latter to the superstitious worship of the Chinese. It was by means of these traders that Europeans were led to visit these islands, and open up an intercourse which is now ripening into friendly association for the purposes of commerce.

We are glad that Dr. Seemann's book is not encumbered by a heterogeneous massing of so-called manners and customs, but that observation for the most part takes the place of hearsay oddities. Besides, so much has been done in this direction, that we must begin

* Specimens of various kinds of trepang may be seen in the Chinese division of the Food Collection at the Kensington Museum.

de novo, and, clearing away much of the rubbish, systematize the really good evidence which remains. This has been done to a great extent in Chapter xix, more especially relating to the Fijian religion. Here we find the usual feeling of connection in some way with the departed —a belief in the creation, flood, and destruction of the world—of a kind of heaven which is rather difficult to reach—of a punishment for cowards, etc. Their priests are certainly odd characters, and evidently make good use of their friendly relations with the gods, the offerings to which they *carefully look after*.

Not only may parallels be found between Old-World and Fijian customs, but, to carry comparisons further, the Fijian language does, in Dr. Seemann's estimation, vie with our soft Spanish or Italian in euphony. We should bear in mind that the Sclavonic languages look alarming when written, but are far different spoken. The Fijian, like the Greek language, has its three numbers—which one would hardly imagine—and in reading the names, *b* is sounded *mb*, *d-nd*, *g-ng*, *g-ngg*, and *c* like *th* soft. Repetition is in great use colloquially, and some of the ordinary compound words are scarcely shorter than formidable German composites, for instance, an "*ill-tempered* man," would be a "tamata *dauvakacudrucudruya*."

And now the question arises, what will become of Fiji? Its value is before the world. Who will occupy it? England refuses the offer of Cakobau the king; will the French do so? However, Dr. Seemann's critical observations enable him to say, "I have no doubt as to the future of Fiji." Nor have we. "The importance of the group once recognized, nothing will stop our race from taking possession of it, and replacing barbarism and strife by civilization and peaceful industry." It appears that colonization is rapidly taking place. Land is being purchased by our countrymen, trade is spreading, and as a consequence of this, vessels are carrying the means and the instruments of civilization to the group, and collecting the fruits of this new West Indies for the Australian and other markets. Another point of interest attaching to this group is—as will be seen on reference to the appendix—that in the event of mail communication between Panama and Sydney, the island of Kandavu would be a good central position for a coaling station and general depôt for the Pacific. Besides, as the French are masters of Tahiti and New Caledonia—naval and military stations in the Pacific—our shipping would be entirely exposed on this great ocean without a place of refuge or defence.

Au reste, some books of travel are written to sell, and hence they refer to the imagination only; but this is a book evidently intended

to instruct, and to speak throughout to the mind of the reader. And if important topics are not treated so fully as might be, and information in some respects is scanty, we must remember this collection of facts, notes of travel, and general observations, was made by the author while busily and devotedly engaged in a particular duty. Throughout, we perceive the experienced traveller, the practical philosopher, and the man of science, and our great regret is, that Dr. Seemann had not the opportunity and means of devoting himself to the critical examination of the ethnology and ethnography of the Fijian Islanders as he has of the botany of their islands. However, amid a good deal of confused information on these islands, it is refreshing to read a book like this, and feel, that its facts are reliable, its observations forcible, and its arguments to the point—that it is, in fact, a good authority on these islands, and one which the general and the scientific reader will peruse with both satisfaction and profit.

THE RELATION OF MAN TO THE INFERIOR FORMS OF ANIMAL LIFE.

By CHARLES S. WAKE, Esq., F.A.S.L.

Important as is the question of the relation between man and the lower animals, there can be no doubt that all inquiries as to the real nature of that relation have hitherto failed. Both materialists and spiritualists have been alike at fault. Neither of them has got beyond the mere external points of resemblance, the one of the body, the other of the mind; whereas the true question is, not in what do man and the lower animals agree, but in what do they differ so as to cause man's great superiority? The reason why the metaphysicians have thus failed is that, shackled as they have been by the prejudices of a too jealous theology, they have so framed the fundamental idea of their science, that the application of its truths to the subject of man's relation to the lower animals could not have any satisfactory result. On the other hand, the materialists, although their facts are abundant, have failed, because they have sought to deduce their theories from mere physical data, almost ignoring the influence of the spiritual powers in the phenomena of animal being and action. They have

been content to refer man's superiority to his possession of a greater capacity and finer texture of brain, combined with that of a refined organ of touch, forgetting that such superiority, with the higher nervous structure itself, may both be due merely to the operation of spiritual causes. Although Professor Huxley is by no means of this latter opinion, yet he may be quoted as an authority against any theory founded on mere structural differences between man and the lower animals; for he says "no absolute structural line of demarcation, wider than that between the animals which immediately succeed us in the scale, can be drawn between the animal world and ourselves." Whether *his* explanation of man's superiority is sufficient will be shortly seen.

Before endeavouring to ascertain by the application of the principles of psychology, the relation of man to the lower animals, it will be necessary to examine rather more fully the question of man's higher nervous structure. Of course it is impossible to *demonstrate* what influence over mental development the brain may have, or what ratio the development of the one bears to that of the other. It is quite evident, however, that the brain proper is not really essential to the exercise of mental power. If we take the invertebrata, creatures that have no brain, but merely one or more small nervous ganglia in its place, we see the exercise of great mental activity, and of a process of reasoning, simple though it may be in its nature. Comparing the actions of the invertebrata with those of the vertebrata, although we observe a marked advance in reasoning power, yet the increase is by no means proportioned to that of the nervous development as seen in the vertebrate brain. Judging from that fact, and from the small difference comparatively in the development of their respective brains, we should expect to see in man but little advance in mental development over the higher mammalia. It is not so, however. The superiority of man over the highest of the mammalia is far greater than that of any of the latter over the invertebrata. Nor is it merely an increase of intelligence. It is rather an enlargement of the mental powers, leading to the accumulation of stores of knowledge utterly unattainable by brute creatures, proving in man a mental development in some sense differing in kind as well as in degree.

Nor does the addition of a refined sense of touch account for man's superiority. As Sir Charles Bell has well said, "the hand corresponds to the superior mental capacities with which man is endowed. The instrument is capable of executing whatever his ingenuity suggests. Nevertheless, the possession of the ready implement is not the cause

of man's superiority, nor is its aptness for execution the measure of his attainments. So we rather say with Galen, that man has a hand, because he is the wisest of creatures, than ascribe to his possession of a hand his superiority of knowledge." It may be added that the argument just drawn from a comparison of the development of the brain in different animals, with the amount of intelligence seen in their actions, may be equally drawn from a comparison of that intelligence with the development of the organ of touch. Superior as is the human hand over that of the ape, that superiority is by no means equal to man's intellectual superiority over the most intelligent of the lower animals. As an instrument of communication with the outer world, and as a means of obtaining a true knowledge of form, size, and distance, man is perhaps as much indebted to the hand as to the eye; but without the mental faculty of combining their various sensations, the human hand would have no superiority in result over that of the ape.

Equally weak is the reasoning which ascribes brute inferiority to the want of the power of speech. True it is that language is the great instrument of man's progress in knowledge, but it is no less true that man's possession of the gift of speech can only be accounted for by the supposition that he is of a superior spiritual nature, language itself being the chief outward sign of such superiority. The lower animals themselves not only use certain sounds by which to express certain emotions, but they are able also to communicate their ideas to each other. In those sounds we have the rudiments of the speech of man, and they are as perfect for the use for which they are designed as are the operations of the mental powers which interpret them. The peculiar structure of the human organs of speech as little explains man's possession of a language, as does his superior brain development the greater development of his intellectual powers. Those organs are no doubt especially fitted in man for articulation, but many animals can produce sounds as articulate as those of man; and some birds can even speak with remarkable clearness and volubility. This shows convincingly that "the main difference lies in the internal faculty or propensity. . . . . The perfect correspondence between the vocal instrument, and the laws governing the motions of the air is a contrivance, but that which prompts to the first efforts at articulation is in our intellectual nature."

In endeavouring to ascertain the true nature of the relationship between man and the lower animals, it will be necessary to treat of that relationship as of a twofold nature—that of the body, and that

of the soul, or whatever that principle may be in which reside the mental and emotional powers—as though the development of the powers of the soul is dependent, in the first place at least, on the body, they in reality exist independent of it. To show the analogy between the physical constitution of man and that of the lower animals, it will be sufficient to confine our attention to the development of the nervous system, as seen in the several organs of sense, that system being the portion of the bodily organism through which the inner principle of being holds intercourse with the outer world.

Considered as a nervous animal, man is seen to be allied to the lowest animated forms beneath him. The human being has five organs of special sense, but when we examine their operation we find that, however different may be the sensations transmitted by each, they may all be reduced to one single sense, that of touch or feeling. Smell and taste are dependent on touch, equally with seeing and hearing. In each case the impression is received by a sensitive surface, which is affected by contact with the operating medium, the difference between the sensations transmitted being caused by the structure of the organs themselves, rather than by any peculiarity in their operation. If we survey the animal kingdom we see the several organs of sense gradually losing their high and special development, until, when we reach the lowest form of animal life, no special organ of sense can be detected, and it is doubted even whether any nervous structure exists. Even, however, in the actions of the protozoa,—animals without the slightest trace of any bodily organisation,—we observe the operation of something like sensation, revealing the presence of a general sense of touch. This is the very simplest form of nervous development (if that term may be applied to it), and of course it is not pretended that there is any knowledge on the part of the protozoa of the sensation. It is wholly instinctive, and that because the operation is not of a special organ of sense, but merely that of the general nervous sensitiveness which underlies all the special media of sensation.

It is not until a nervous system can be distinctly traced that we find the development of a special organ of sense. When it shows itself, however, it is seen to be one of those that man also possesses. And it is important to our argument to observe that the sensational organs of the lower animals, when they *are* developed, are always essentially the same as those of man. He has in their perfection all the organs of sense possessed by any of the creatures below him. Passing through the radiata, the mollusca, and the articulata, we

reach the vertebrata, in which the organs of sense are more perfectly developed than in any other of the lower animals. Among the vertebrata we may accept the ape as the nearest approach to man in bodily structure, and we find that the special nervous developments are the same in both, the only apparent difference being in the superior fineness of the organ of touch in man, he being the only animal that possesses such an organ in the form of a true and distinct hand, used only as an organ of touch. That fact is significant, as showing the special development of the general underlying nervous sensitiveness, and, as such, being the most important of all the special nervous developments.

The organs of sense being thus alike in man and in the lower animals, the sensations which are the result of the operation of those organs, must also have a resemblance. Light affects the eye of the eagle in the same way as it affects that of man, and the same sensation will in each case be impressed on the brain. And not only so, but that sensation will be interpreted in the same way in both cases. The object from which the light which gives rise to that sensation is transmitted will have the same appearance to each. Nor can we doubt its being so, when we watch brute actions, and compare them with those of man under like circumstances.

We have now reached the second point of relation between man and the lower animals, and we are met on the threshold of inquiry by the important question—to the operation of what principle are the actions of the lower animals to be referred? Are they phenomena accompanying a peculiar state or development of a material organisation merely; or must they be ascribed to the operation of a spiritual principle, independent for its being of material organisation? We, perhaps, know too little of the true nature of matter to judge whether in its ultimate essence it may not be capable of thought or will. The intimate union between the body and soul of man points to a very near approach, if not in essence, at least in mode of being, of matter to mind. Until, however, we know more of the nature of the material essence, we are justified in asserting that matter cannot think or will.

The actions of many of the lower animals so closely resemble those of man, in their motives and object, that it is usual, as we have seen, to refer brute inferiority to the restricted development of the mental powers, consequent on some difference in nervous structure, or on the want of the power of speech, without supposing any actual inferiority of mental nature. None can doubt that brute

action is very often governed by observation, and by reasoning on the result of such observation. If that be so, it proves the exercise of the mental process (call it thought or intuition), from which judgment flows, and of the will which gives effect to the determinations of the reason. Nor can we deny to the lower animals the attributes of bodily sensibility and mental emotion. This sameness between the spiritual powers of man and the lower animals must be remembered. For if the actions and emotions of the latter are merely the result of the activity of the forces of a material organism, so must those of the former be also. Superior as the result of the operation of the mental powers may be in the case of man, if those powers operate alike in both, they must inhere in the same principle, spiritual or material. If, however, brute action is not the mere result of bodily organisation it must depend on the activity of a spiritual principle; and it is asked what is that principle? If we examine man's internal or mental actions we see that they may be classified as those of emotion, thought, and will, none of which we ever think of referring to the body alone. It is the spiritual principle of being we call the soul, the very man himself, which thinks, and which shows the result of its thought in the physical actions that flow from the determination of the will. If it be so, can we deny to the lower animals the possession of the soul? Even if the exercise of thought could be imagined to be the operation of a cunningly devised material mechanism, no mere machine could give the light which sparkles in the eye of the affectionate dog, or prompt the care of the sagacious elephant.

If the lower animals have a certain spiritual principle, which we call the soul, as part of their being, man, as a being of like emotions, thought, and mental action, must have the same spiritual principle, the possession of which is the second point of relation between them. It will perhaps be objected, that man may have a principle of being which acts in the same way as that possessed by the lower animals without its being the same in essence—that indeed the brutes have what has been called the animal soul which dies with the body, but that man has a spirit possessing all the powers of the soul in a superior degree, and in a fuller development, and which is immortal.

It is not for us to say that there *cannot* be two distinct kinds of spiritual essence which, though different, have yet the same powers and attributes, the only distinction between them being that those powers are more fully developed in the one than in the other. It does, however, seem to be improbable. The soul is made up of cer-

tain powers or attributes which alone give it existence, and the operation of which is alone the sign of spiritual life. Wherever, then, those powers exist, there also is the soul as the principle of being in which they inhere, and any inferiority of soul action in any particular case must depend, not on actual inferiority of spiritual nature, but either on some inferiority of bodily structure which hinders the development of the soul's powers, or on the absence altogether of some aid to that development. That man's intellectual superiority depends on superiority of bodily structure merely we think few people will now affirm. The structural difference between man and the ape is, indeed, comparatively slight; yet we see in the one case that intelligence is limited in its exercise to the satisfaction of certain wants, and soon reaches a point beyond which it can be developed no further; whilst, on the other, mental exercise is not bounded by any bodily, or even spiritual, want, the capacity for knowledge increasing with every addition made to it.

The true explanation of the inferiority of the lower animals is, that their mental powers, though not imperfect, either in their constitution, development, or operation, and though containing in themselves the germ of all truth, are yet limited in their very nature, and incapable, without the assistance of a higher principle, of reaching beyond a certain range of knowledge. The soul is essentially instinctive; but, superadded to instinct, it possesses the power of storing up its sensational experiences, of recalling them by memory, and of reasoning from them and forming judgments as to their relations. It is observable, however, that although brute reason enables its subjects to reason from past experience as to the proper conduct under particular circumstances, it never enables them to get further. The lower animals have no power of abstraction or generalization, in the proper signification of those words. They do, indeed, sometimes act as though they exercise such a power, but they do not in reality; the appearance of it arising from the intimate connection which always continues in the brute mind between instinct and reason. However perfect may be their reasoning about particulars, it never leads them to the knowledge of general truths, nor even to the remembrance of particular ones, except so far only as they may be influential over present action.

Referring now to the mental actions of man, it may be stated as an infallible formula that, if we add to the results of the mental actions of the lower animals the operation of the principle of reflection, we shall have, as the result, the perfected knowledge of man. If that be

so, the true explanation of the difference between human and brute mental development is to be found, not in any difference in capability of development, but in the fact of the operation of the mental powers being enlarged in man by the addition of a spiritual principle which the lower animals have not. The origin of all mental action is to be traced to certain intuitions which reside in, and may be said to be the life of, the soul. It is their working which is seen in instinct, and to dependence on them the operation of the simple reason of the lower animals owes all its perfection. Those intuitions are all-powerful in brute action; indeed, so much so, that, while they are the great living principles of action, the animal may be said to be merely the instrument by which they work. In man those intuitions are equally influential, and he is, up to a certain period of his life, equally their instrument. As man gains experience, however, he loses his dependence on the intuitions of instinct for the guidance of his conduct, and with the exercise of reflection he gradually arrives at the knowledge of certain principles of truth, on which are founded all the superstructures of his philosophy. But those principles of truth are in reality nothing but the very intuitions which had in infancy guided his hand, now made his own, and become the instruments by which he works for the extension of his knowledge.

We see, then, in man two spiritual principles; one in which the principles or intuitions of truth reside, and the other that which searches out those principles and makes them its own. The first, that which the lower animals possess equally with man, and which is the seat of the will, is the *soul*. The second, that which man alone possesses, is the *spirit*—the seat of that reflection, or higher reason, to the operation of which on the sensations conveyed through the several sensuous organs man's physical science is owing. There are two objections to this theory of a dual spiritual nature, which I must shortly consider. The first, the philological one, is plausible, but, in reality, of no force. It is that the two words, "soul" and "spirit" (the only two names which can be used to denote the two spiritual principles I have named) are both of the same meaning, literally denoting "air" or "breath". It has been said that "soul is coincident with *halitus*, breath, derived from *halare*, to breathe, a root familiar in the words *exhale, inhale*, and itself only an enlarged form of the earlier word *aëō* or *áō*, a beautiful onomatopœia, expressive in its long, open, vowels of the very act which it designates"; and that "spirit takes us to the very origin of words, resting on the beautiful lisp or whisper with which the breezes quiver the leaves." That may

be quite true; but it is a remarkable fact that in most languages, and probably in all the older ones, there *are* two such words, having the same ultimate meaning, and yet used as though intended to express different ideas.

As little conclusive is the objection that we cannot imagine more than one kind of spiritual essence, and that, therefore, the idea of a dual spiritual nature in man cannot be true. Such belief is the result, not of reasoning, but of mere prejudice, which, if contrary to fact, must be got rid of as quickly as possible. We know nothing of spirit in its essence, nor what may be the modes of its development. If, therefore, we find certain facts, which cannot be explained without the supposition of there being more than one of such modes, or even spiritual essences, we are bound to receive that supposition as a fact, throwing on one side all our prejudices, whether they are connected with religious belief, or arise from defective scientific education.

THE PROCEEDINGS OF THE ANTHROPOLOGICAL SOCIETY OF PARIS.*

THE two last *livraisons* of the *Bulletins* of the Anthropological Society of Paris are now before us, and are fully equal in scientific interest to any of the previous publications which have emanated from the same source. The lucid and comprehensive exposition of the past labours of the Paris Society, with which M. Broca favoured us, and which was published in the last number of the *Anthropological Review*, has placed our readers entirely *au courant* with the past labours of the French Society; and it will be the future task of the editors of the *Anthropological Review* to give periodical abstracts of the summarized conclusions which are arrived at in the Quarterly Bulletins of the Paris Society.

Enjoying the high privileges of the presidency in 1863 of M. de Quatrefages, with M. Gratiolet as vice-president, M. Broca as general secretary, and MM. Trélat and Dally as annual secretaries, the Society is as efficiently represented as it was during the years when the

* Bulletins de la Société d'Anthropologie de Paris. Vol. iv. First and Second Fasciculas—January to May, 1863.

presidential chair was filled by MM. Martin Magron, Isidore Geoffroy St. Hilaire, Béclard, and Boudin; and the fact that more than two hundred members are at present enrolled in its books, renders the future prosperity of the Society, so long as it shall continue to be superintended under efficient management, a question of certain success. The interest which the French nation has long taken in sound anthropology, would augur well for the success of the science in that country; and we regret that England has been so tardy in the establishment of an Anthropological Society.

The remarkable work by the Abbé Brasseur de Bourbourg, on the *Quiché Language of Central America*, forms the subject of an able report by M. Pruner Bey. The analysis which he makes of this work is of the most lucid character; and those who have had the patience, or the sorrow, to wade through the tedious and turgid platitudes with which the abbé has filled his work, will feel a pleasure in reading the nine terse pages in which M. Pruner Bey has compressed the few known facts respecting the Quichés. M. Pruner Bey concluded his abstract of the abbé's generalizations by stating that he had examined in the galleries of the Museum twelve skulls of Quiché Indians of Vera Cruz, and that he discovered in them characters slightly different from those ordinarily assigned to the American cranium; thus, while the Mexican skull is brachycephalic, the skulls of the Guatemalan aborigines exhibited a type intermediate between dolicho- and brachycephaly. In a philological sense, while the languages of Mexico and of the North American nations are polysynthetic, the Quiché, Maya, and the language of Yucatan are analytic; in the Quiché an idea can only be expressed by a periphrasis, which in the Aztec is conveyed in one word. The Quiché drama which M. Brasseur publishes, was gathered from the tradition of the natives, and written in European characters shortly after the period of the *Conquistadores*.

M. Pruner Bey also contributes a valuable report on the climate of Egypt, on which Dr. Schnepf has recently published a work. Both these learned authorities agree that the influence of cold and wet on foreigners in hot climates is much more visible than in our latitudes. Dr. Schnepf describes, on the banks of Lake Menzaleh, the existence of a variety of men entirely distinct from the Arabs; and he controverts the opinion of M. Mariette, who considers them descendants of the Hyksos. Dr. Schnepf states that the Hyksos were strangers in Egypt; and the most minute researches do not enable us to find in this country a single foreign family who have prospered and have propagated for many generations. He concludes that the Hyksos,

whether they were Shemites or not, do not appear to have escaped this law, any more than the modern Greeks and Turks. As regards the Jews, Dr. Schnepf denies the cosmopolitism; and alleging that, amongst the Egyptian Jews of the present day, not one can trace back their descent to the fifth generation, he condemns the Jews to the same destiny as the other immigrants into Egypt—that of extinction. M. Pruner Bey denies these propositions; and to his able report on the subject we must refer for the arguments which he brings forward.

Chile, although its zoological and botanical forms of life have been long studied with success, has many points of interest yet unascertained in its anthropology. A commission, consisting of MM. Béclard and Rameau, with M. Pruner Bey as reporter, has drawn up a series of interrogatories. Taking the Chileno population in 1854 as 1,340,000 souls, of which 20,000 are foreigners, the population being comprised under Europeans born in the country, and Mestizos. There are some mulattos, but no negroes; whilst only 10,000 pure Indians still survive. The committee put a series of the most searching questions respecting the physical characters of the Araucaños, and contrast the frequently divergent statements of D'Orbigny, Dumoutier and Blanchard, Domeyko, Molina, Smith, and Parish. No author states whether the Araucaños are prognathous or orthognathous; and the committee state that no artificial deformation of the skull appears to have existed amongst the Chilenos. As regards the religious ideas of the Araucaños, no general proposition appears to be laid down; while it is admitted that they believe in a future life, that their Paradise is placed in the west, and that they believe in a good and an evil principle. As regards the Mestizos, their females appear less fertile than the Spaniards, and their greatest vice is drunkenness. All the classes of society include Mestizos, and the race has produced generals and other dignitaries. The committee do not correlate this fact with the form of government adopted in Chile. The reading of this series of instructions produced an animated debate on the questions relative to the colour of the skin, which were alluded to in the report. MM. Pruner Bey, Quatrefages, Dally, Trélat, Sanson, Bertillon, D'Omalius D'Halloy, and others joined in the discussion, which ultimately centered in the question of the "fundamental antithesis" of anthropology —monogeny or polygeny. We shall intentionally pass over the discussion in the present stage of the question, while we express our admiration for the manner in which the contending parties marshalled their arguments.

M. Pruner Bey contributes an entirely original and highly valuable

memoir on the hair as a characteristic of human race, examined by microscopical researches. The paper is of great length; it will eventually appear in the *Memoirs* of the Society. He has compared together transverse sections of the hair of twenty-four great races of mankind; and he also describes the hair of various regions of the body, and on the head of the anthropoid and other apes. He arranges them in a scale, one pole of which is represented by the Papuas, the Boschismen, and the Negroes, with flattened felted hair; the other pole being represented by the Polynesians, Malays, Siamese, Japanese, Túranians, and the Americans, not excepting the Esquimaux; all these types having rounded, smooth, straight hair. The Aryan races are intermediate between these two extremes. The Basques differ from the Aryan stock as much in their hair as by their language. One single hair, when it presents the average form characteristic of the race, can be assigned to its proper ethnic signification. Mixed breeds are recognizable by the fusion and juxtaposition of the characters inherent in the hair of their parents. We have no doubt that this memoir, when all the facts are laid before the scientific public, will prove of the most lasting service to anthropologists, as enabling them to bring to bear microscopical analysis on the question of ethnic distinction.

M. de Mantegazza sends an amusing memoir on the comparative physiognomy of the human races, from which many curious extracts may be made. The Negroes have the neck shorter than any race; the Jews shorter than the Russians. The knee is very low in the Russians. The Esthonians have the largest feet; Negroes have longest, Jews shortest arms. Russians have smallest, Lettons largest hands. Russians have greatest, Tshuvashes smallest feet. M. Mantegazza describes the tibia of the Gaucho, which is curved by long riding, and his great toe, which is separated from the others by reason of the small stirrups they use. The inhabitants of St. Kilda, M. Mantegazza asserts, have the same conformation, which they have acquired by the free use of the great toe, which they employ in climbing the cliffs to obtain the seafowl on which they feed. M. Jouvencel hinted that it would be very interesting to know whether there was any trace of heredity in these deformations. M. Gratiolet remarked that M. Mantegazza's labour was rather an amusing history of the customs, fashions, and caprices of the people which he observed, and had no direct connection with human physiognomy; to which the learned Italian author had given a signification different from that which was generally accepted.

The anatomy and physiology of the brain still continues to be the subject of elaborate memoirs from MM. Gratiolet and Broca. The former gentleman contributes a note on the skull of a paralytic and epileptic idiot deprived of speech, in which the capacity of the cranium was exceedingly reduced, without attaining absolute microcephaly. The right hemisphere of the brain vastly exceeded the left in size. M. Broca called attention to the skull of an idiot, a Negro, and a Mulatress, in which the cerebral convolutions were strongly marked; and described some diseased brains, in which lesions of the posterior third of the third frontal convolution had been accompanied with a privation of the faculty of language.

M. Garrigou laid before the Society some skulls, at least of Merovingian age, which had been derived from a sepulture near St. Acheul. These skulls are of great interest, as well as all the human remains of historical age from the locality. Messrs. Duckworth and Turner brought the subject before the British Association at Newcastle; and we understand that some valuable information will be given shortly to the Anthropological Society of London, coincident with the presentation of some skulls and other remains of "Gallo-Roman" age from St. Acheul, by the President of the Society.

The human jaw from Moulin-Quignon produced an active debate before the Paris Society. On the 16th April, M. de Quatrefages announced the discovery of M. Boucher de Perthes. M. Giraldés observed at the time that the obliquity of the *ramus* and the form of the condyle might be produced by the age of the subject, which should be carefully determined before any race-characters should be assigned to it. On the 7th May, the adverse opinion of the English palæontologists was laid before the Society by M. Giraldés; whilst M. Broca communicated the substance of a letter from Mr. Carter Blake to the same effect. M. Broca, in a caustic speech, was inclined to attribute some of the scepticism of the British palæontologists to the influence both of the Darwinian and anti-Darwinian schools, which united to decry a discovery which was to a certain extent opposed to the conclusions of either party. M. Gosse (fils) laid great stress on the testimony of the witnesses in favour of the authenticity of the jaw, and inquired whether it was expected that M. Boucher de Perthes should summon together the *savans* of the four quarters of the globe before making any new discovery. M. d'Omalius d'Halloy announced that the "Abbeville Conference" would shortly be held, and suggested the postponement of the debate, which was unanimously acceded to.

M. Bertillon contributes a most valuable memoir on the method to

be adopted in anthropology, in which he cites an admirable table of measurements of the circumference of the thorax in the Scotch militia as an example of the method of tabulation and ordination of anthropological statistics. We regret that our space precludes us from an adequate analysis of this most valuable and technical memoir.

M. Boudin, in a memoir which will appear at length, called attention to the singular fact that the number of military exemptions on account of height in France has diminished in a remarkable manner during the last thirty years, and supported this statement by facts and statistics. The average weight of the French soldier, as compared with the Indian sepoy, is as follows :—

	Height. mètre.	Weight. kilo.
Sepoy (Madras) - - -	1·682	50·397
Sepoy (Bengal) - - -	1·733	58·438
French soldier (chasseur à cheval de la garde) - - - -	1·679	64·500

From the above, it will be seen how much heavier and shorter, both proportionally and actually, is the French soldier than the Hindu.

A report on the origin of the nations of French Senegal, by M. Simonot, terminates the *Bulletin;* in which, however, the concluding parts do not appear. Senegambia, according to M. Santamaria, is peopled by seven distinct families; the Berber, Arab, Mandingo, Sarajoulet, Peulhs, Yoloffe, and Shéréra. M. Santamaria correlates these existing types with the descendants of some of the sons of Noah, mentioned in the tenth chapter of Genesis. M. Simonot leaves to M. Santamaria the entire responsibility of this theory, and proceeds at once to the known physical facts. He seems to assign to the Negro race in Africa a higher intellectual value than some of his contemporaries and colleagues. He lays great stress on the arts of tanning, pottery, metallurgy, etc., practised by the Negroes, and especially upon their sentiment of music. Although constant nudity has excluded from their minds almost every instinct of shame, yet M. Simonot brings one instance to the contrary, to which it is our duty to assign its full value. The memoir is of the most valuable character, and we hope at some future time to lay before our readers an account of its termination.

ANTHROPOLOGY AT THE BRITISH ASSOCIATION.

THE scientific carnival of Great Britain has again come and gone. The "wise week", as the good people of Newcastle called it, was on the whole most successful. The profuse hospitality of Sir William Armstrong, and the people of Newcastle generally, will long render this meeting memorable in the annals of the British Association. How far has the science of Anthropology been advanced by this meeting? All branches of science have their own accounts to render; and it is only our duty to examine the amount of advance made in the science of Mankind. Anthropology in name is not yet recognized in theory; but it is to some extent in practice. It is not a little remarkable, that some of those who are most opposed to the recognition of Anthropology as a recognized branch of science into the Association, are the very men who, in their practice at least, admit the claims of Anthropology, and who read papers which are entirely anthropological. For instance, Mr. Crawfurd, one of England's most consistent and venerable ethnographers, lost no opportunity of protesting against the introduction of anthropological papers into Section E; and yet, with that inconsistency for which he is occasionally distinguished, was one of the very first men in the section to read a paper on a purely anthropological subject. Mr. Crawfurd's paper, entitled "Notes on Sir C. Lyell's Antiquity of Man", was from the beginning to the end a paper on Man or Mankind, as distinguished from Ethnology, or the science of the Races of Man. No writer of any authority, either English, American, or continental, will now call the question of the antiquity of man an ethnological question. It is pure and simple an anthropological question. Other papers bearing on the same subject, we understand, were rejected by the Committee of Section E, because they were anthropological! and could not be read because Anthropology was not recognized by Section E, which was entirely confined to Geography and Ethnology. But such an example from one of the most eminent Vice-Presidents of the Section, could not fail to have its influence on other members; and the result was that, notwithstanding several anthropological papers were refused by the Committee, still there were a larger number accepted. An analysis of the papers read in Section E gives the following results. There were altogether forty-one papers an-

nounced to be read before the Section; eighteen of these were geographical, nine were ethnological, and fourteen anthropological. Besides, there were several anthropological papers, which were not accepted by the Committee simply because they *were* anthropological. Most of the geographical papers, we believe, were original; but there were only five out of nine of the ethnological papers which had not been read before, and, in the words of the President, "amply discussed" in London. All the anthropological papers read before Section E, including two which were not read, were, with one exception, never read or discussed before any other scientific body. It will, then, be seen that anthropologists have yet much work to do before their science can be generally recognized. But, as far as practice goes, they have cause for satisfaction; and the recognition of Anthropology in theory must soon follow its recognition in practice.

On the whole, therefore, we have no hesitation in saying that the general result of the meeting must be considered satisfactory to anthropologists. Several circumstances combined to make Section E one of the most popular sections, as, indeed, it always has been when at all properly conducted. In the first place, the Section was presided over by the prince of presidents, who was a host in himself, and who, we are bound to admit, contributed far more than any other man to make Section E popular and its proceedings satisfactory. Sir R. Murchison was free from the littlemindedness shewn by some of his associates. His whole conduct in the chair was both fair and honest; and all his exertions were used to render the meeting agreeable to all parties. Thus, we know he frequently felt it his duty to remain at his post to his own serious inconvenience. We can only regret that his other high duties, as one of the chief rulers of the Association, caused him to occasionally absent himself. There was no one at all capable of filling the post like Sir Roderick. It is no disparagement that his two countrymen, who acted occasionally in his absence, were far from being so successful in their presidency as their eminent friend. These statements are acknowledged truisms: but we are bound to say that even Sir Roderick occasionally failed to give satisfaction to all parties. We have received several letters complaining of "the apparent puff" which Sir Roderick appended to his introductory address! We certainly were ourselves a little surprised to hear Sir Roderick coolly enumerate a list of ethnological papers to be read before the Section, most of which, as we have stated, had been read long ago, and were "stale, flat, and unprofitable". Out of the six ethnological papers which Sir

Roderick announced to be read, there was only one which had not been read before! In a previous part of his address, he had mentioned some of these papers as having been "*read and amply discussed*". As to the strong remarks we have received respecting this part of the President's address, we would observe that in all cases they have been from those who were not personally present to witness the support and courtesy which Sir Roderick invariably gave to anthropological papers and to anthropologists. We would also observe, that Sir Roderick gave a *vivâ voce* statement, which was not printed, at the end of his address, in which he acknowledged the valuable additions of papers the Section was likely to have from the representatives of the Anthropological Society of London. Nor do we think that Sir Roderick meant to do more in what he said than give his aid to ethnological science. We feel sure that he cares far too much for truth to care for any one set of men more than another. We ourselves are grateful for any aid he renders to ethnological science. We are as much interested in the result of ethnological science as of general Anthropology. There may be difference of opinions as to the best means of advancing the Science of Mankind; but we are sure that there is no difference of opinion as to the importance of Ethnology, or the Science of Races. Nor do we think that any man is worthy of the name of an ethnologist, who looks with disfavour on those anthropologists who believe that the Science of Mankind embraces something more than Ethnology. Rather ought they to rejoice to see the great success which is attending the labours of their fellow-workers. The British Association is for the advancement of science, perfectly regardless of personal opinions or party cliques. We feel sure, therefore, that it only requires a little time to remove any jealousy that may exist in the breasts of some ethnologists respecting the success attending the labours of anthropologists. Let them learn not to quarrel with the decrees of Nature. Astronomy was not arrested in her progress by the clamours of the astrologers; nor will anthropologists cease to develope the extent, magnitude, and importance of their science by the invectives of ethnologists. Rather let them develope their own subject, and look with rejoicing on the beneficent wave which will ere long raise them from their present state of isolation, and raise them to their place as one of the branches of light which will illuminate the great system of organic life.

We will now give a general abstract of the anthropological papers read at the Association. On a future occasion, more of these papers will be printed at length. We have classed the papers under two

heads: General Anthropology;* and one special branch of that subject—Ethnology.

GENERAL ANTHROPOLOGY.

On Anthropological Classification. By Dr. JAMES HUNT, F.S.A., President of the Anthropological Society of London.—After the author had given a short outline of the nature of the subject, in which he distinctly stated that the origin of man belongs entirely to mythical times, and is a question which could not at present be solved by human experience, he proposed merely to classify man as he now exists, or as he has existed since the historical period, without reference to those distinctions being absolutely original. It was Dr. Hunt's duty to inquire—were these well-defined differences in mankind at the earliest dawn of history? a question which he answered in the affirmative, as the ethnology of the most anciently known continents is very much the same as at the present day. He considered also that these differences had been permanent; and the scope of the present paper was to inquire whether these physical differences were so well marked as to serve as the basis of classification. He reviewed the classifications of Ephorus of Cuma, Buffon, Linnæus, Gmelin, Herder, Voltaire, Blumenbach, Lacépède, Duméril, Maltebrun, Cuvier, Virey, Hunter, Lawrence, Metzan, Bory, Desmoulins, Prichard, Lesson, Fischer, Morton, Latham, Hombron, Jacquinot, D'Omalius D'Halloy, Pickering, Burke, Knox, Agassiz, Crawfurd, and Isidore Geoffroy St. Hilaire, and offered critical remarks on each of these systems as a whole. Many of them were of the most arbitrary nature, the offspring of chance or human fancy, unfounded on the knowledge of any ascertained facts, and there was no attempt to define the method on which a sound anthropological classification might be based. The multiplicity of the systems at present in vogue is a sufficient refutation of the truth of most of them. Dr. Hunt considered that anatomy and physiology were the primary sources whence an adequate knowledge of the principles of anthropological classification could be derived. Language he considered no test of race. He laid great stress upon the form of the cranium as the most convenient and certain distinctive mark, and spoke with great approval of the ternary classification adopted by Gratiolet, who divides mankind into the Frontal (European), Parietal (Mongol), and Occipital (Negro) races—these cranial distinctions being coincident with the mental and moral characters which were

* To those papers which were not read before Section E, we have affixed the letter of the Section after the title of the paper.

solely dependent on man's physical structure. Other secondary physical characters could also be used with advantage; and Dr. Hunt especially alluded to the classifications which might be based upon colour, stature, hair and beard, longevity, diseases, temperaments, odour, entozoa, and other subsidiary points of distinction. The degree of intelligence was the chief character distinguishing man from the inferior animals. If a classifier of the negroes of the West Indies were to use language alone as a criterion, he would classify them under the head of Europeans, with whom their acquired language is identical; their physical characters alone mark them as African. Dr. Hunt considered that language must be utterly discarded as the first principle of anthropological classification. He gave a far higher value to religion, and to art, considering language merely as the third element. It was possible to change the language of a race; but apparently impossible to change either their religion or their innate ideas of art. That there are well-marked physical, mental, and moral distinctions in mankind is as well an ascertained fact as that there are differences in the orang and the chimpanzee. We must, therefore, classify mankind according to the physical, and psychological differences which now exist, for the present state of anthropology will not enable us to say how and when these distinctions have originated.

Cranioscopy of South American Nations. By Mr. C. Carter Blake, F.G.S., F.A.S.L.—The object of the paper was to re-consider some of the primary principles on which those cranioscopists who have classified the races of South America, have based their arrangements, and to call especial attention to a few important exceptions which appear to invalidate the generalisations commonly accepted. Every practical cranioscopist is aware that Retzius's classification of human skulls into brachycephalic and dolichocephalic was applied by that illustrious Swede to the arrangement of the great leading South American types. The lamented and deceased cranioscopist gave, as as examples of the brachycephalic type, as exhibited in South America, the tribes of Ecuador, Peru, Bolivia, Chile, La Plata, Patagonia, and Tierra del Fuego; while the dolichocephalic or longheaded type found its representatives in the populations of Carib, Guarani, Brazilian, Paraguay, and Uruguay origin. This broad generalised statement of facts still remains the accepted and predominant hypothesis. How far is it consonant with the extent of our knowledge on the subject? Those few tribes and nations of South America of which any accurate and reliable information exists will be briefly recapitulated in the

following observations, and especial attention drawn to the *desiderata* which appear in our collections. The geographical order will be adhered to, apart from any broad generalisation, which may arise, based on craniometrical classification; such generalisations, *e.g.*, as that of Morton, who divided the whole American races into two great families, the Toltecan, comprising the extinct half-civilised tribes which have become extinct during a pre-historic period, and the barbarous tribes. The latter division was subordinated amongst the Appalachian, Brazilian, Patagonian, and Fuegian branches. Mr. Blake then proceeded to criticise these types in detail. In the first place, he pointed to Colombia; the characteristic type prevailing amongst the tribes of Venezuela is the Carib. The skull is here markedly long-headed, with the parietal diameter less than the longitudinal. The frontal bones are strongly flattened; the zygomatic arches large. Accurate and reliable evidence respecting the cranial conformation of the natives of Ecuador is wanting. The Cara and the Scyri unknown. There were several types in Peru; *e.g.* the Chincha type shortheaded; the Chimu type longheaded, so far as known; the Inca or Quichua shortheaded, flattened from before to behind by compression from the frontal bone to the occiput. In Bolivia there were the Aymará, longheaded, of which few examples existed in our collection; the Titicacan, longheaded, but of whom the other physical characters are unknown. In Chile the type was longheaded, so far as known at the present day. The Anthropological Society of Paris has recently sent a series of queries respecting the physical characters of the Chile races, which showed the utter want of information on this topic. In Patagonia the type was also longheaded, as in Tierra del Fuego, Paraguay, La Plata, and Brazil.

Commodore MAURY asked the author of the paper whether there was any relation between the distribution of any of the cranial types alluded to and the distribution of the inland basins. An attention to physical geography would, he was confident, throw much light on the question of race.

Mr. MARKHAM pointed out that the Quichua and Aymará tribes were distinct as regards language. The Aymará language was as distinct from the Quichua as the Italian from the Spanish. The Chinchas were far more nearly allied to the Quichuas than were the Aymarás.

Mr. CRAWFURD, after complimenting the author of the paper on the industry with which his materials had been collected, denied that cranioscopy afforded us any sound knowledge of the affinities of races. He would tell an anecdote which was entirely new to the British Association. Professor Owen on one occasion had described a skull

which was really that of a Scotchman, as that of a Negro. Therefore, Mr. Crawfurd concluded that knowledge of the cranium was no guide to the affinities of races. He complained that Mr. Blake had not offered any generalisation as to the number of indigenous stocks in South America, and stated that no such generalisation could be arrived at by mere cranioscopy.

After a few remarks from Mr. GREENFIELD,

Dr. JAMES HUNT said that he had intended not to offer any remarks on the interesting paper that had just been read, but he could not silently listen to the observations of Mr. Crawfurd without rising to protest to the British Association against the sneers which Mr. Crawfurd was in the habit of casting in the teeth of anthropologists who devoted themselves to the science of man. Section E. had become notorious for their neglect of all true science relating to man. All other sections made advance from year to year, but Section E. did not. The same subjects were discussed every year, and no progress was made or would be until anthropology became recognised by the Association. Many men of science devoted to this subject despaired of doing any good by attending the Association. Dr. Hincks said yesterday that Mr. Crawfurd was entirely ignorant of the science of language, and he was obliged also to say that his friend, Mr. Crawfurd, was not competent to judge of the value of cranioscopy as a basis for the classification of man. It was useless to argue with one who rejected both physical and physiological characters as a basis of classification, and one who was also opposed to the evidence of language.

Professor WILSON said he was sorry that it had been suggested that the subject under discussion was of no importance. He was not a craniologist, and therefore would not presume to offer an opinion upon the questions at issue, but he would mention a fact which had some bearing upon them. He was acquainted with a hatter in Canada, carrying on an extensive business both with the English and French communities. He took the measure of his customers' heads according to the Paris fashion, and he (Dr. Wilson) had collected the models—upwards of a hundred—and, with the assistance of a scientific friend, had classified them, without referring to the names affixed to them, in two distinct groups, the English and the French. Upon examining the names, it was found that, with two or three exceptions, they had made a perfectly right classification, though the only data they went upon was the shape of the skull. The science of craniology might have been carried too far, but he was sure it was calculated to lead to very valuable results. There were no doubt distinct national types of skulls, and he hoped that anthropologists, instead of being discountenanced would receive every encouragement from the British Association.

Mr. CARTER BLAKE, in reply, agreed with Captain Maury with respect to the advantages which were derived from a comparison of the cranial types with the geographical localities. He answered Mr. Crawfurd's complaint respecting the absence of any generalizations respecting the origin of the South American natives, by saying that he was quite content to wait and accumulate facts. As regards Mr. Crawfurd's amusing anecdotes, he was afraid his learned friend had put the

cart before the horse. Professor Owen did not mistake the skull of a Scotchman for that of a Negro; it was a Negro skull he mistook for that of a Scotchman. Physical characters alone could decide the affinities of a race; and as Mr. Crawfurd had rejected the test of language, he failed to perceive what the characters were on which his classification was founded.

Sir RODERICK MURCHISON, after commending the learning and ability of the paper, hoped that the science of anthropology, which had been founded by his friends, Blumenbach, Retzius, and Von Baer, would ere long be recognised by the scientific world.

On the Physical and Mental Characters of the Negro. By Dr. JAMES HUNT, President of the Anthropological Society of London.—The author said he had been collecting facts upon the subject for another society; but he was induced to bring it before the Association from the fact that it had never been brought before a scientific audience in England. In discussing the question, he would have nothing to do with anything but the full-blooded, woolly-headed, typical Negro, to the exclusion of the half-breed. The object of the paper was to determine the position which one well-defined race occupies in the genus *homo*, and the relation or analogy which the Negro race bears to animated nature generally. He had selected the Negro race, as it seemed to be an intermediate form between the highest and lowest existing races of man. In discussing the question, he had nothing to do with the origin of man, for analogies did not necessarily include relationship. The skin and hair are by no means the only things which distinguish the Negro from the European, even physically; and the difference is greater still mentally and morally. The skeleton of the Negro is generally heavier, and the bones are larger and thicker, in proportion to the muscles, than those of the European. The bones are also whiter, from the abundance of calcareous salts. The thorax is compressed; the leg is longer than in Europeans, but is made to look shorter on account of the ankle being only between $1\frac{1}{3}$ in. to $1\frac{1}{2}$ in. above the ground; the heel is both flat and long. Burmeister has pointed out the resemblance of the foot and the position of the toes of the Negro to that of the ape; and many observers have noticed that the Negroes have frequently used the great toe as a thumb. After pointing out several minor particulars, in which the Negro differs from the European, and quoting the opinions of several writers on the capacity of the Negro cranium, the paper recommended caution in accepting such capacity of the cranium as any absolute test of the intellectual power of any race. The brain of a Negro has a smoky tint, not found in that of an European. The hair is essenti-

ally different; and the voice resembles sometimes the alto of an eunuch—there being a peculiarity about it by which he can always be distinguished. Dr. Louis Büchner, after summing up the peculiarities of the Negro, says they exhibit the most decided approach to the ape. Other distinguished anatomists and physiologists had expressed a similar opinion. The assertion that the Negro only requires an opportunity for becoming civilized is disproved by history. The African race have had the benefit of the Egyptian, Carthaginian, and Roman civilization, but nowhere did they become civilized. The many cases of civilized blacks are not pure Negroes; but, in nearly every case where they had become men of mark, they had European blood in their veins. In the West Indian Islands it has frequently been observed that all the Negroes in places of trust which require intelligence have European features. Negro children are precocious; but no advance in education can be made after they arrive at the age of puberty —they still continue mentally children. It has been said that the present slave-holders of America no more think of rebellion amongst their full-blooded slaves than they do of rebellion amongst their cows and horses. That was because the tranquillity of Negoes in their approach to civilization resembled the content of domestic animals. From all the evidence brought forward, the writer of the paper saw no reason to believe that the pure Negro ever advances further in intellect than an intelligent European boy of fourteen years of age. After citing authorities to prove the low psychological character of the Negro, the paper continued:—"We now know it to be a patent fact that there are races existing which have no history, and that the Negro is one of these races. From the most remote antiquity, the Negro race seem to have been what they now are." The writer could see no evidence to support the opinion of some writers that the Negro had degenerated from some higher form of civilization. Everywhere we see the European as the conqueror and the dominant race; and no amount of education will ever alter the decrees of Nature's laws. The general deductions he would make were—First, that there is as good reason for classifying the Negro as a distinct species from the European as there is for making the ass a distinct species from the zebra; second, that the Negro is inferior intellectually to the European; third, that the analogies are far more numerous between the Negro and the ape, than between the European and ape. There was in the Negro that assemblage of evidence which would induce an unbiassed observer to make the European and Negro two distinct species.

Mr. GALTON said that the case was briefly this:—Among the Negroes

of Africa there were more frequent instances of an abject and superstitious character, combined with brutal behaviour, than could be paralleled elsewhere in the world. It was a wonder that people like those of Dahomey could mould themselves into any form of society at all, and it was actually found that when the chief of such a tribe died it disintegrated and rapidly disappeared. In short, the tribes of Africa were remarkable for their rapid formation and short continuance. Many of their chiefs were of alien descent, and it was remarkable how their greatest kingdoms had been ruled by Tawareks—men with Arab blood—or, as Captain Speke now informed us, by straight-haired Wahumas. How did it happen, then, that so degraded a people could furnish men capable of constructing nations out of the loosest materials? The question once stated was almost its own reply. The Negro, though on the average extremely base, was by no means a member of a race lying at a dead level. On the contrary, it had the capacity of frequently producing able men capable of taking an equal position with Europeans. The fact of a race being distinguished by the diversity of its members was well known to ethnologists. There were black and red sub-divisions of many North African races, and the contrast between the well-fed and ill-fed classes of the same tribe of Negroes was often such as to amount apparently to a specific difference.

Mr. Craft said that though he was not of pure African descent he was black enough to attempt to say a few words in reference to the paper which had just been read. Many scientific gentlemen present would probably dispute that; but at any rate, supposing Adam to have been the founder of a race of men, white men had no stronger claim to him as their father than black men, as it was admitted that owing to the climate in which he commenced his existence, he could have been neither black nor white, but copper coloured. As Africans were very dark, and the inhabitants of Northern Europe very fair, and as, moreover, the nations of Southern Europe were much darker than those of Northern Europe, it was perfectly fair to suppose that climate had a tendency to bleach as well as to blacken. The thickness of the skull of the Negro had been wisely arranged by Providence to defend the brain from the tropical climate in which he lived. If God had not given them thick skulls their brains would probably have become very much like those of many scientific gentlemen of the present day. The woolly hair was not considered by Africans as a mark of inferiority, though some of them shaved it off, but it also answered the purpose of defending the head from the sun. With regard to his not being a true African—his grandmother and grandfather were both of pure Negro blood. His grandfather was a chief of the West Coast; but, through the treachery of some white men, who doubtless thought themselves greatly his superiors, he was kidnapped and taken to America, where he (Mr. Craft) was born. He had recently been to Africa on a visit to the King of Dahomey. He found there considerable diversities even among the Africans themselves. Those of Sierra Leone had prominent, almost Jewish features. Their heels were quite as short, on the whole, as those of any other race, and upon the

whole they were well formed. Persons who had any knowledge of Africans knew that, when they enjoyed advantages, they were capable of making good use of them. He might refer to the instance of the little girl brought to this country by Captain Forbes. This child was presented to the Queen, who had her carefully educated. When she grew up, she mingled in good society, and interested every one by her proficiency in music, and recently she had been married to a commercial gentleman of colour at Lagos. Another case was mentioned by Mr. Chambers in one of his works, and another case was that of Mr. Crowther, who was well-known to many gentlemen in this country. One word with reference to the ancient Britons. When Julius Cæsar came to this country, he said of the natives that they were such stupid people that they were not fit to make slaves of in Rome. It had taken a long time to make Englishmen what they now were, and, therefore, it was not wonderful if the Negroes made slow progress in intellectual development. It was, however, proved that they made very rapid progress when placed in advantageous circumstances. As to the Negro not being erect, the same thing might be said of agricultural labourers in this country. He pointed to Hayti as furnishing an instance of independence of character and intellectual power on the part of the Negro, and contended that in America the degraded position which he was forced to occupy gave him no chance of proving what he really was capable of doing. He was sorry that scientific and learned men should waste their time in discussing a subject that could prove of no benefit to mankind. He spoke with great deference to their opinions, but, for his own part, firmly agreed with Cowper that—

> Fleecy locks and black complexion
> Cannot alter nature's claim;
> Skins may differ, but affection
> Dwells in white and black the same.

The Rev. H. B. Tristram said he had been a chaplain for several years in a mixed school for blacks and whites in one of the West Indian islands, and could testify that the children of free Negroes who were engaged in honourable occupations were invariably more intelligent than the children of slaves.

Mr. Carter Blake said that he agreed substantially with the author of the paper upon the anatomical evidence which he had brought forward with regard to the Negro race. Mr. Craft had stated that the heels of the Negro were not longer than those of Europeans, but that was contrary to the testimony of anatomists. He contended that in nearly every instance of a Negro attaining intellectual eminence it had been ascertained that there was an admixture of European blood in his veins. The evidence of the paternity of full-blooded African Negroes, in contact with Europeans, was rather difficult to ascertain. Anatomists had ascertained that there were wide differences in the structure of the Negro and European, and he specified some instances of such diversity. If the woolly hair and thick skull of the Negro were given to him by a bountiful Providence to fit him for living in a tropical climate, the inhabitants of Brazil were suffering great

injustice, for they had neither woolly hair nor thick skulls. With regard to the philanthropic element, he thought it ought not to have been introduced into the discussion. In conclusion, he expressed his opinion that, till Mr. Craft could rail away the seal which nature had impressed on the physical character of the Negro, his breath was all spent in vain when he contended for the equality of the African and European races.

Sir E. Belcher said that he had spent nearly all his life among the Africans, and believed that, when properly educated, they could be as true, as faithful, and as sound-hearted as Englishmen. He mentioned several instances which he had met with in his travels of remarkable intelligence in the Negro, and scouted the idea that he was naturally, either physically or mentally, of inferior capacity to other human races.

Professor Wilson claimed for the author of the paper and those gentlemen who supported him, the credit of being influenced by a desire to search out facts which could throw a light on the important subject under discussion. At the same time he differed considerably from them in some of their conclusions. It was very important to have sufficient data before forming a theory, and he thought that Sir Charles Lyell and others who contended that the intellectual progress of the Negro stopped at the age of fourteen, had fallen into the error which a person would who went into a workhouse among the most degraded and wretched of its occupants to find intellectual culture and capacity. The fact was that very few, if any, black children had any opportunity of pursuing their education after the age of fourteen, and, in addition to that drawback, they had the misfortune to belong to a degraded and oppressed class, which was crushed and held down in the social world. The wonder was that any of these unfortunate people had energy enough to make their escape and to acquire knowledge sufficient to enable them to carve a way for themselves through life as not many of them did. The English character was made up of many elements; but a few hundred years ago the inhabitants of this island were cruel, unlettered, practical people. When put under good training and subjected to certain influences the Anglo-Saxon proved capable of remarkable development, owing chiefly to the native energy of his character. The same quality was observable in some tribes of the present day, such as the New Zealander, and it was not wise therefore to argue as though the absence of combination denoted a natural and primary inferiority of race.

Mr. Crawfurd made a few observations on Negroes generally.

Dr. Hunt in reply said he was sorry that some speakers had attempted to draw away the attention of the audience from the great facts under discussion. Scientific physical facts had been met with vague general assertions, and no reply had been attempted to be made by any speaker against the facts that had been adduced. He would leave his scientific friends to judge of the value of Mr. Craft's remarks. He was sorry, however, that the speaker had not confined himself to uttering exploded theories, but had accused scientific men of wasting their time when discussing this subject. He for one

thought it was a great pity that scientific men in this country had so long delayed to bring these facts prominently before the public, and thus explode some of the popular delusions on the subject. It was not at all necessary for Mr. Craft to tell anyone at all acquainted with the subject that he was not a pure Negro, although there were many present who were deluded with the idea that he was. As to the statement that Britons did not make good slaves, he was quite ready to admit the fact; and he knew of no European race that would make good slaves. In this respect Negroes were certainly far superior to Europeans. He then briefly replied to other speakers, and in conclusion, said the time was passed when the great fact he had brought forward could be longer ignored, and however reluctant he had been to introduce the topic, he felt that good would arise from the discussion that had taken place. All he asked was that scientific evidence of this character should be met by scientific argument, and not by poetical clap-trap, or by gratuitous and worthless assumptions.

On Cranial Deformities, more especially on the Scaphocephalic Skull. By WILLIAM TURNER, ESQ. (D *a.*)—The Author commenced by stating that deformities of the skull might be occasioned by artificial means, by pathological changes, by posthumous changes, and by developmental irregularities and deficiencies. He in a great measure restricted himself in his paper to a consideration of the effects produced on cranial form by developmental irregularities and variations in the mode of ossific formation, more especially by premature or retarded union of the cranial bones along their sutural lines and at their synchondroses. He arranged the sutures connecting the bones of the skull cap into a vertical-transverse group, a median longitudinal, and two lateral longitudinal groups; and agreeing with Professor Virchow, of Berlin, he stated that should a premature ossification take place in one, or more than one, of the whole, or a part, of a line of sutures, then the growth of the skull corresponding to, and in a direction perpendicular to the line of synostosis will occur, and diminished length, or breadth, or height, as the case may be, will be occasioned. He illustrated this proposition by describing a peculiarly elongated and laterally compressed form of skull to which, along with Professor Von Baer, of St. Petersburg, he applied the name Scaphocephalus. Four as yet undescribed examples of this peculiar boat-shaped skull had come under his notice. The whole of these crania were characterised by possessing the following characters:—Absence of a sagittal suture, and consequent blending of the two parietal bones; absence of parietal eminences, lateral compression, great elongation. He then discussed at length the two theories which had been advanced to account for the production of such a form of skull;

and concluded that the balance of evidence was in favour of the theory that it originated from a premature union of the sagittal margins of the two parietal bones, and consequent compensatory growth of the skull in the antero-posterior direction, rather than from the development of the bi-parietal bone from a single median vertical centre. The author then directed attention to the importance of attending to the above proposition in ethnological inquiry, more especially with reference to the production, through its action, of various aberrant forms of skull in individuals of any given nationality, which may cause them to possess a shape of head quite different from that of the race to which they belong. He pointed out, moreover, that obliteration of the sutures to a greater or less extent exists in the crania of the Flathead Indians, which have been distorted by artificial means; his observations agreeing with those of Professor Daniel Wilson in this particular. He was of opinion that the pressure occasioned the tendency to premature union of the bones in these cases. The author did not think that persons possessing crania the form of which had been modified by premature synostosis necessarily exhibited any special tendencies to cerebral disease or deficiencies in their mental capacities.

Human Cranium from Amiens.—Mr. William Turner read a few notes, by Mr. Henry Duckworth, on the circumstances attending the discovery of a human skull at Amiens, and also a short paper of his own on the anatomical characters of the said cranium. The skull was produced and exhibited before the section. The cranium was found by Mr. Henry Duckworth, F.G.S., in the summer of 1861, whilst on a visit to the quarries of St. Acheul. It was dug out of the deposit named by the workmen the "Découvert" Bed. Its depth from the surface was about six feet. The anatomical description by Mr. Turner comprised an account of the appearance of the bones, and of the form and general characters of the skull. One of the most interesting points connected with it being its remarkable resemblance to the much discussed "Engis" skull, of which it might almost have been considered to have been a reduced copy. There was nothing in the appearance of the skull, or in the circumstances of its discovery to lead to the supposition that it threw any light on the question of the antiquity of man.

Mr. R. A. Godwin-Austen thought that the discoveries at Amiens had no bearing on the antiquity of man, as the whole of the locality had been a burying-place for an enormous period of time. He had visited the locality where the skeleton was dis-

covered, from which the famous jaw-bone, which had attracted so much attention, was taken; and he believed that the deposit there was nothing but an accumulation of drift from the chalk hills which overhung that particular spot.

The Neanderthal Skull. (C.) Professor WILLIAM KING gave reasons for believing it to belong to the Clydian period, and to be specifically distinct from man. He contended that the Neanderthal man was living in the concluding division of the glacial or Clydian period. He felt it necessary to advert to a question involved in the present subject, and on which a preconceived opinion, amounting to a prejudice, is pretty generally entertained. Some authors have no hesitation in admitting that the genius *Homo* has been represented by more species than one now living; but there is unquestionably prevailing a deep-rooted conviction that the psychical and speech endowments of *Homo sapiens* are generic; although there is nothing to warrant such a belief, and much to oppose it. He saw no reason to doubt that there have been species of the genus in existence, unpossessed of those gifts which so eminently place the existing human races, but in different degrees, above the highest anthropoid apes. Why may there not have been a Pliocene, or a Clydian species, possessed of no higher faculties than such as would enable it to erect a protecting shed, fashion a stone for special purposes, or store up food for winter; but like the gorilla, or chimpanzee, be devoid of speech, and equally as unconscious of the existence of a Godhead? Man's psychical endowments are visibly expressed in the prominent frontal and the elevated vertex of his cranium. But considering that the Neanderthal skull is eminently simial in its great characters, he felt himself constrained to believe that the thoughts and desires which once dwelt within it never soared beyond that of the brute. The Andamaner indisputably possesses the dimmest conception as to the existence of the Creator in the universe: his ideas on this subject, and on his own moral obligations place him very little above animals of marked sagacity, nevertheless they are such as to specifically identify him with *Homo sapiens*. Furthermore, the strictly human conformation of his brain-case bears out the collocation. Psychical gifts of a lower grade than those characterising the Andamaner cannot be conceived to exist: they stand next to brute benightedness. Applying these arguments to the Neanderthal skull, and considering its close resemblance to that of the chimpanzee, and, moreover knowing that the simial peculiarities are unimprovable—incapable of moral and theositic conceptions—he saw no reason to believe otherwise than that similar darkness

characterised the beings whom he did not hesitate to call *Homo Neanderthalensis.*

The Anatomy of a Young Chimpanzee. By Dr. Embleton (D *a*).—On the 11th December, 1862, the body of a male chimpanzee, said to be about one year and a half or two years old, and which had died of bronchopneumonia, in a menagerie, at Newcastle, was purchased for the College of Medicine. It was scantily covered with black hair, except around the muzzle and arms, where the hair was silvery grey. It was fresh and in good condition, the trunk rather bulky, the chest large, the arms strong and muscular, the hands partly covered on the dorsum of the palm with black hair, which did not extend to the fingers, the palm or surface smooth, naked, and of a dusky flesh colour, the thumb small and short, measuring with its metacarpal bone, 2 in., the middle finger being 5 in. long, the legs comparatively short and weak, but fleshy to the heels, the feet rather more covered on the dorsum with hair than the hand, the toes and the soles resembling in smoothness, absence of hair and colour, the corresponding parts of the hands, the great toe freely detached from the others, and resembling a strong thumb, measured with its metatarsal, $2\frac{1}{2}$ in., the third toe, $3\frac{1}{2}$ in. The thumb appeared much shorter, slenderer, and weaker than the other fingers; the great toe thicker, stronger, and shorter than the other toes. The following dimensions of parts were carefully taken:—Length from vertex to the sole of the heel, 2 ft. 5 in.; length from top of sternum to tuber ischii, 1 ft. $\frac{3}{4}$ in.; length of leg from top of femur to sole, $11\frac{1}{2}$ in.; length of arm, from head of humerus to tip of middle digit, 1 ft. 5 in.; length of hand and foot, each $5\frac{1}{2}$ in.; circumference of chest at broadest part, 1 ft. $4\frac{3}{4}$ in. The whole body weighed 16 lb. 6 oz. avoirdupois. Owing to its tender age, and the necessity for preserving it, the skeleton was not much studied, and time did not allow of dissection of much of the muscular system. It may be observed, however, that there exist thirteen pairs of ribs and, therefore, thirteen dorsal vertebræ, and in consequence the number of lumbar vertebræ is reduced to four. The diaphragm was well arched, and very strong; the psous parvus muscle was present, and attached as in a man. The skin, arranged by Mr. John Hancock, according to the exact dimensions and form of the animal, was deposited in the museum of the Natural History Society, and the skeleton, carefully prepared by Thomas Craster, in the collection of the College of Medicine. A dissection of the muscles and tendons of the palm of the hands is shown in sketch F. It was observed that the opponens pollicis muscle was

wanting; the others appear to be disposed as those of the human hand. Professor Huxley having maintained, in his *Man's Place in Nature*, that the hind limbs of the so-called quadrumane is not a hand, but in reality a foot, it was necessary to direct particular attention to the muscles and tendons of that part. Sketch C shows the posterior region of the leg, which is flat, and rather broad, and the fleshy parts of the lateral muscles are continued down to the ankles; the gastrocnemii are the principal features hiding the presence of the soleus, and the absence of a plantaris. Sketch B, fig. 1, presents the anterior region and the dorsum of the foot. The peroneus brevis, which is inserted into the fifth metatarsal, arises here above the peroneus longus, the tendon of which, passing behind the outer ancle, runs obliquely into the sole of the foot.

Next internal to the peronei lies the rather slender extensor longus digitorum, the four tendons of which pass to the four outer toes. Between this muscle and the edge of the tibia lie three muscles, one being a good deal overlapped by the other two. These two send their tendons to be inserted, the *inner* into the inner side and under part of the first cuneiform bone, the *outer* into the base of the metatarsal bone of the great toe. The third muscle, at first deeply placed, comes out, a little above the ankle, from beneath the other two, and its tendon, lying between that of the outer of the two and the tendon of the long extensor, runs to be inserted upon the dorsal surface of the base of the first phalanx of the great toe. On the dorsum of the foot we find the short extensor of the toes, a broader muscle, and extending further towards the inner side of the foot than in man, by means of considerable superadded slip, which diverges abruptly inwards from the other part of the muscle, sends its tendon along the metatarsal bone of the great toe parallel with the tendon of the last muscle, to be inserted into the base of the second or terminal phalanx of that toe.

Every toe, then, in the chimpanzee, has at least a long and a short extensor for its phalanges, whilst the great toe has an extensor for its metatarsal, another for its cuneiform bone. Thus it may be said that there are four muscles of the great toe to ensure free and varied mobility in the sense of extension; the fifth toe has, as in man, in addition to its phalangeal extensions, the peroneus brevis attached to its metatarsal. Of the four extensions of the great toe, the two innermost appear to represent the tibialis anticus of human anatomy, divided to secure variety of motions in the root of the great toe; the next would quite answer to the extensor proprius pollicis only; it is inserted

into the base of the first instead of the terminal phalanx; the fourth or short extensor is a new foot muscle, and unrepresented in either the hand or foot of man. Thus, in the peroneal region, and in that of the extensor, we find all the corresponding human muscles represented; moreover, there are certain modifications of arrangement, and a new muscle for the first digit introduced, to give more freedom and variety of movement in extension to that member. This muscle is a foot muscle, not a hand one; the divided tibialis anticus is rather a foot than a hand arrangement. There are no hand muscles introduced, though the great toe has four, and the thumb three extensors. There is here a great toe, more moveable in extension than any thumb.

We now turn to the sole of the foot. The three superficial muscles, the abductor pollicis, the flexor brevis digit., and the abductor minimi and digitorum are, as in the human sole, the first to come into view. On detaching the two last from the heel bone, we find, towards the outer border of the foot, a flexor brevis minimi digiti, and in the middle region the lumbricales and the tendons of the long and short flexors of the toes, with a small muscle accessory to the lumbricales arising from the long flexor tendon before its division. No muscular accessories arising from the os calcis and attached to the long flexor tendon were observed. At the outer border of the foot, when we abduct strongly the great toe, which can thus be brought to nearly a right angle with the rest of the foot, we see, after a little dissection, the abductor pollicis as a short doubly reuniform muscle, extending from the heel to the base of the first phalanx of the great toe, occupying considerable space, and close to it lie the two halves of the flexor brevis pollicis, separated by the tendon of the flexor longus pollicis. Lastly, between the great toe and the second is clearly to be observed the abductor pollicis. All these muscles of the great toe are highly developed and of great power; and, if they all act together, will very forcibly pull the great toe towards the middle of the sole of the foot; if the flexors of the other toes are made to act at the same time, the result will be a strong, rather oblique opposition of the great toe to the other four toes; and if an object like the branch of a tree be placed in the sole, it will be grasped with much firmness. There remains, however, to be noticed an interesting arrangement by which that action will be enforced and made more secure. It is this: the muscle called flexor longus pollicis is largely developed in the leg, extending down to the inner ankle, and ends in a strong tendon, which runs into the sole of the foot close to the os calcis, and apart, as in man, from the other tendons, opposite

to the foot of the great toe, it divides into two slips; one, the lesser, runs outwards at a certain angle, being confined at first under a strong ligament, as under a pulley, to the great toe, as its long flexor tendon; the other, the larger division of the tendon, passes straight onward to the other toes, supplying each with an additional tendon. It will be obvious to any one inspecting sketch E, that when this muscle (therein named flexor digitorum et pollicis) is put in action, it will necessarily draw the great toe and the other four toes together, and that simultaneously, towards the middle of the sole. This addition of a fourth set of flexor tendons for the four outer toes, and with it a distinct provision for the simultaneous action of those toes with the first, is very remarkable, and seems to complete the foot of the chimpanzee as a perfect instrument of prehension. The absence of the human flexor accessorius may be presumed to be an advantage, as it provides more space in the sole for the object grasped, and as no transversus pedis was found, the distal ends of the metatarsals are left more free to separate and enlarge the grasp. Next to the surface of the bones was beautifully seen the tendon of the peroneus longus muscle, resuming, in its bony and ligamentous groove to its destination, the base of the metatarsal bone of the great toe. When we consider, then, this elaborate mechanism, and see that the opening of the foot is most carefully provided for by the existence in connection with the four outer toes of a short and a long extensor for each, and by the presence of four distinct extensors for the great toe alone; and observe that flexion or prehension is made certain, exact, and powerful, by the arrangement of flexors for each of the four outer toes, vigorous short muscles of the great toe, and a necessarily synchronous action of the great toe and the other four, we cannot avoid the conclusion that we have examined the most admirable prehensile organ adapted to arboreal life that we can imagine; we must also feel persuaded that the hinder limb of the chimpanzee is still a foot, a prehensile foot of high perfection, surpassing even the hand itself in firmness and precision of grasp, but not a hand.

The additions to the ordinary mechanism of the human foot that have here been noticed, are not, so to speak, borrowed from the hand, but are either extensions of the plan of the foot, or new parts that occur neither in the hands nor in the foot of man.

The function of prehension by the foot, as is well known, is one enjoyed, not only by apes and monkeys, but by many other animals; the parrots, cockatoos, and other birds, and the chameleon, to cite familiar examples, have prehensile feet; it is attached to the nasal

organ in the tapirs and elephants, to the lips in the giraffes, horses, etc., and to the opposite or caudal end of the spine in certain monkeys and marsupials. Prehension, therefore, cannot be taken in the characteristic function of the hand of the higher animals.

Digestive Organs. The tongue, broad, fleshy, soft, and delicate, much resembled the tongue of a child. The milk-teeth, twenty in number, somewhat blackened, were all present. The total length of the alimentary canal was 15 feet 10 inches, or about six and a half times the length of the body. It is thus made up, viz.—

	Ft.	Ins.
From lip to pharynx - - - -	0	3
,, pharynx to cardia - - - -	0	6
Length of stomach along greater curve - -	1	$8\frac{1}{2}$
,, duodenum - - - -	0	6
,, jejunum and ilium - - -	10	0
,, caput cæcum coli - - -	0	$2\frac{1}{2}$
,, appendix vermiformis - - -	0	$4\frac{1}{2}$
,, colon, ascending, transverse, & descending	1	$4\frac{3}{4}$
,, sigmoid curve - - - - -	0	7
,, rectum - - - - - -	0	4
	15	10

Outlines of the stomach and cæcum accompany the paper. The œsophagus is somewhat narrow; the stomach is shorter and more globular than in man; the left end, or *cul de sac*, well defined; the pyloric extremity, funnel-shaped and abruptly bent back towards the cardia, which it nearly touches, is slightly marked off at the bend by a constriction, and there are two other smaller constrictions between this part and the duodenum. The drawing of the caput cæcum coli does not require particular notice. The peritoneum appears to be disposed very much on the human model, the foramen of Winslow, for instance, and the bag behind the stomach, were quite human.

The liver, with the gall-bladder, all the parts at the transverse fissure being cut close off, weighed $10\frac{1}{2}$ ozs. Its vessels and membranes resembled those of a child. It is divided into two great lobes, right and left, and each of these has a small rather detached lobule situated behind the transverse fissure, and bordering on the fissure of the vena cava. The spleen is rather thin, longish, and notched on its anterior border. The suprarenal glands are long and of a yellow colour, contrasting with the kidneys, which are brown, and also unlobulated.

Skull and Brain. The vault of the cranium having been removed, casts in plaster were at once taken by Mr. John Hancock of the inner surface of the bone of the brain covered by the dura mater, and, after

the brain was removed, of the cerebral surface of the base of the skull. Thus a correct cast of the whole cerebral surface was secured. Before the brain was in any way disturbed from its natural position, the relation of the posterior lobes of the cerebrum to the cerebellum was carefully observed; and the ten persons present, anatomists and naturalists, were unanimous in declaring that the former projected backwards over the latter a quarter of an inch. In the removal of the brain, the disposition of the membrane and nerves was observed to be strikingly similar to the corresponding human parts. The arterial circle of Willis was quite human. The entire encephalon with arachnoid and pia mater, vessels and nerves attached, and as much of the spinal cord as could well be reached by an ordinary scalpel, was carefully removed, and its weight was found to be 13 ozs. and 6 drachms, which is to the weight of the whole body nearly as 1 is to 19. The vessels having been removed, and the membranes, the whole brain was put at once into spirits for preservation and hardening, so that the separate weights of cerebrum and cerebellum were not taken. The three great lobes of each cerebral hemisphere were seen well developed; the two anterior lobes formed together a blunt projection forwards, whilst beneath their inner borders projected as ridges downwards, the under surface of these lobes were distinctly concave; the middle lobes were more prominent downwards than in man, and the projection of the posterior lobes backwards, overlapping the cerebellum, appeared as decided as before. After the brain had been for three days in spirits, the cerebral hemispheres measured in length $4\frac{3}{8}$ ins., in breadth across the middle or widest part $3\frac{3}{4}$ ins., the greatest width of the cerebellar hemispheres being $2\frac{7}{8}$ ins.; so that the cerebellum is markedly overlapped laterally as well as posteriorly by the posterior lobes of the cerebrum. The convolutions of the cerebral hemispheres were numerous, somewhat intricate, and partially symmetrical, two main sulci, traceable one from the Sylvian fissure, the other from the base at the back of the crura cerebri, appeared to mark out even on the top of the hemispheres the division into anterior, middle, and posterior lobes, or masses of convolutions. The island of Reil in the fissure of Sylvius was quite evident with three small convolutions. The corpus callosum, $1\frac{3}{4}$ in. in the length, showed as in man distinct though minute transverse striations, and a longitudinal raphe formed of two slightly raised lines and an intervening groove. A section of the right hemisphere, to expose the lateral ventricle, showed as bold and as numerous projections of the external sulci into the white centrum ovale as are commonly seen in

the human cerebrum. The ventricle itself was beautifully distinct, its anterior cornu curving boldly outwards in front of the striated body, its middle cornu winding outwards and downwards to the very bottom of the large middle lobe, and containing the hippocampus major and the corpus fimbriatus, and the choroid plexus and its posterior cornu extending in an ample curve backwards and inwards, so as almost to touch the grey matter of the surface next the median line, and having within it the projection called hippocampus minor, which may still be seen. On the floor of the body of the ventricle are to be seen the corpora striata, the tæniæ semicirculares and the free edge of the fornix with the choroid plexus; these last lie on the velum interpositum, which covers the third ventricle and the optic thalami, quite as in man. Further investigation in this direction was forborne, as it was thought desirable to preserve, for the present occasion, the parts already enumerated. The fourth ventricle, as it is called, and its walls, as they could be examined without injuring those parts, were inspected; the cavity was closed behind, and had its small choroid plexus after the human pattern; a second similar, but smaller, plexus existed on each side, just outside of the ventricle, and attached to the cerebellum. The point of the calamus scriptorius was well defined, but no white lines of origin of the auditory nerve were distinguished; on the other side of the medulla oblongata, the usual nerves were met with, and the pyramids and olivary bodies clearly to be seen, but they were not further examined. The cerebellum was laminated, and had the great human divisions; on examining that part which overhangs the medulla oblongata, the inferior vermiform process, the uvula and tonsils, the flocculus, and other parts enumerated in human anatomy, could, without difficulty, be dissected out; the superior vermiform process, also, was evident on raising up carefully the posterior lobes of the brain.

The conclusions arrived at in this short and imperfect investigation are, it will easily be seen, those which have already and for some time past been made public by Professor Huxley, viz.: 1, that the chimpanzee is not, properly speaking, quadrumanous, but that it possesses four prehensile extremities, two hands, namely, and two feet; and 2, that the brain of the chimpanzee differs from the brain of the man only in size and weight, therefore in the smaller size and extent of its cerebral convolutions; the same parts, without exception, exist in both brains. Whether the cerebral matter of the ape differs from that of man in microscopic characters, or how otherwise it may differ, are problems yet to be worked out.

On the syndactylous condition of the hand in man and the anthropoid apes. By C. CARTER BLAKE, F.G.S., F.A.S.L. (D.)—I have now the honour to call the attention of the Section to a curious abnormity which is presented by the integument of a specimen of old male gorilla which was brought from the Gaboon by Mr. W. Winwood Reade, and presented by that gentleman to the Museum of the Anthropological Society of London. The specimens of Gorilla which have been the subjects of the elaborate and complete memoirs which have appeared from the pen of MM. Duvernoy and Isidore Geoffroy St. Hilaire, in the Archives of the Paris Museum (vols. viii and x), and by Professor Owen in various parts of the *Zoological Transactions*, have, with those described by other authors, all coincided in one attributed character, true as regards the specimens with which they were acquainted, which probably represent the majority of specimens of gorilla which had been examined in Europe. This statement, reduced to a general proposition, was that the integument of the skin of the fingers was more or less connected across the first digital phalanx, in such a manner that the first joints were firmly connected together by skin, sometimes as far as the distal extremity of the first phalanx, sometimes merely to the middle of this phalanx. In no specimen of gorilla, of the description of which I am yet cognisant, are the digits of the anterior extremity free to the same extent as in man, in which the distal extremities of the metacarpals mark the termination of the amount of syndactyly of the hand. In the specimen of gorilla to which allusion is made in this short note, the digits of the fingers present a different condition of connection than in the typical specimens described by zoologists. The second (index), third (medius), and fourth (annulus) digits are free beyond the distal end of the metacarpals as in the human subject; the fifth digit (minimus) is also in a less degree attached to the annulus than in the specimens of gorilla contained in various public museums. We have thus a specimen of gorilla in which the digits of the hand are almost as free as in the hand of the lower races of mankind. Careful examination by a lens, of the integument, before the preparation of the specimen by Mr. Leadbeater, who first called my attention to this abnormity, demonstrates the fact that the epidermis covers the cutis on the inner sides of the interdigital spaces of the first phalanges of this specimen. The consistency of this epidermis merely differs in degree from that of the homologous structure in the foot, and in other parts of the body. It would be interesting to compare such a curious abnormity of the integument with the similar abnormities which exist in the human

species. The human fingers are most frequently connected together by syndactyly, and remain during life in that state of arrested development (as regards the integument) which is typified by the permanent stage of development of the gorilla. On the other hand, I have never yet met, either in the chimpanzee or oran-útan, with a similar case of freedom of digits to that here described. We must, however, recollect that the number of specimens of chimpanzee and oran-utan, which have been accurately described anatomically, form a very small percentage. How many individuals of gorilla may exist, in which a similar "accidental" variety may exist, must remain for a long time unknown to us. Syndactyly is often congenital. A case has recently come before my observation of a married female, in which the *medius* and *annulus* of both hands are firmly connected together by integument. A similar condition prevails in one of her children; another has the deformity on the right hand; whilst the youngest preserves the digits in their normal condition. The speculation whether a like rule or its converse may or may not prevail in the ape; whether it might not through generations during which the congenital defect of the gorilla, or absence of the characteristic syndactyly, might be transmitted, operate towards the production of a more prehensive form of hand, must, however, be postponed until a vaster series of specimens shall be examined by anthropologists or zoologists.

On the ligamentous action of the long muscles in man and other animals. By Dr. Cleland (D*a*.)—The author pointed out that, in the human subject, maximum flexion of the hip-joint could not be obtained along with full extension of the knee, on account of the shortness of the hamstring muscles; and so also maximum flexion of the ankle-joint, along with full extension of the knee, was prevented by the shortness of the gastrocnemius muscle. This limitation of movements by the shortness of muscles, he said was best seen in the humeral region of the horse, where it was so great that very little flexion or extension of the shoulder could occur without a corresponding movement at the elbow; well-marked instances of similar interdependence of joints were to be found in other parts of the horse, and also in other animals—*e.g.*, in the legs and wings of birds. He proceeded to show that movements of that description compelled in the humeral region of the horse were exactly those most frequently and usefully employed by human beings; that the shoulder and elbow were usually flexed and extended together; that likewise in walking, leaping, &c., flexion and extension of the hip, knee, and

ankle went together; that in those movements the long muscles were not alternately contracted and extended, but kept in a state of medium contraction, very slightly altering their length, and were, therefore, evidently not the muscles which produced those movements. On the other hand, it was shown that a muscle passing over two joints, if maintaining a definite length, would cause another muscle passing over only one of them to act upon both. It was argued, that in the movements referred to, the long muscles gave force, but not velocity.

Notes upon the opening of a Cist of the Stone Age, on the Coast of the Moray Frith. By GEORGE E. ROBERTS, F.A.S.L., and Professor BUSK, F.R.S. — Mr. Roberts says that, in company with his friends Dr. Gordon and Mr. Harvey Gem, he had lately visited two mounds situated upon the sandy shores at Bannat Hill, a mile from Burghead; and after examining their contents, they turned their attention to the small cairns of rudely piled stones which lie a few yards from one of the shell middens, and which evidently marked the burial places of the tribe. Two of these were piled around small enclosed spaces, formed by the junction of four upright stones. A fragment of human jaw lying on the sand outside one of those led them to search among its contents for other bones, but unsuccessfully. The second cairn, however, with its central cist, yielded better evidence. This, like the neighbouring tomb, was a rude erection of four flat sandstone slabs, placed vertically, so as to enclose a space 30 inches long by 20 inches in width. The depth of the stone, which nearly corresponded with that of the grave, was 22 inches. Three of the stones had been slightly smoothed before use. The direction of this grave was S.S.E. by N.N.W. This, however, was of no moment, as the adjoining one differed so much in this respect as to lie at nearly right angles to it. The cavity thus formed was filled with sand, into which they dug, and presently succeeded in discovering a skeleton, which had apparently been buried in a crouching position, the legs below the knee being bent beneath the hams, and the head bowed towards the knees, *brachycephalic*, and presenting other peculiarities, which Mr. Busk had described in a note attached to the paper. From the position of the skeleton he was at first inclined to consider that the cist had never been broken into, but the absence of some few of the vertebræ and of the smaller bones, rendered this somewhat uncertain, though the disturbance, whether from curiosity or another motive, seemed to have been insignificant. He regretted, however, to add, that the box in which he

packed the bones was tampered with during its transit from Elgin to London, and some of the bones, including the lower jaw, from which precious evidence might have been obtained bearing on the *Moulin Quignon enigma*, never reached him. He had made inquiries about the matter since, but fruitlessly. No pottery or fashioned stones accompanied the skeleton.

The note by Professor Busk was to the effect that the bones had belonged apparently to a young individual about five feet eight or nine inches in height, of slight make, and no great muscular development. At first sight, from the comparative delicacy of form and want of muscular impressions, one would be inclined to regard them as those of a woman, but if so she must have been of more than the usual stature. Unfortunately no part of the pelvis, which would enable a correct judgment as to this point to be formed, was found among the remains. If the owner was a man he must have been a small size, and not of a strong build, with a remarkably small head for a male. The cranium was decidedly brachycephalic, the proportions of length to breadth being as 1·00 to ·823, and for its size rather unusually high, the proportion of that dimension being to the length as ·803 to 1·00. The forehead was narrow, and the superorbital ridges very slightly projecting, although the frontal sinuses were well developed. Compared with other ancient crania this might be regarded as belonging to the same class as those which had been considered as appertaining to the stone period of the North of Europe.

Mr. Carter Blake said that although the shortheaded proportions of the skull reminded us of the skulls of the stone period of Denmark, or of the skull which had been discovered at Kellet, in Lancashire; although the manner in which the body was entombed, with the corpse in a crouching posture, are to a certain extent in accordance with similar conditions in such ancient remains, as, *e.g.*, those from Aurignac, in the south of France; yet the undoubted association of the skeleton with bronze remains, precluded our conception of such an extreme antiquity as that which would be coeval with the formation of the shell mounds of Denmark. More recent evidences, however, acquired by Mr. Lubbock, have rewarded that inquirer, by undoubted bronze remains from kjokkenmöddings in Scotland, and the important facts which Mr. Roberts and Professor Busk had laid before the Section, have for the first time given us reliable evidence respecting the physical characters of these old prehistoric inhabitants of Scotland. Although the harsher features which characterized the skulls of the Danish stone period are softened, yet there is just so much family likeness as to lead us to the conclusion that one and the same general type of man inhabited Northern Europe, in Denmark, before the Baltic had so changed its beds, as to be no longer capable of

supporting those especially marine mollusca, which have passed away since the advent of our hunting and fishing population on its shores.

J. CRAWFURD, Esq., F.R.S., *On the Commixture of the Races of Man as affecting the Progress of Civilization.*—It was not until the discovery of a new world that races of man of strikingly contrasted qualities came to intermix. In the western world, the intermixture of nations which followed the conquests—first of the Romans, and afterwards of the northern nations—was an union of races of equal quality; and hence it cannot be predicated that either improvement or deterioration was the result. Very different was the case in the eastern world. There Greeks, Romans, and Goths intermingled with races greatly inferior to themselves—such as Egyptians and Syrians—and hence the deterioration to which, in a great measure, must be ascribed that decline in civilization which ended in the downfall of the Roman power. Nature has endowed the various races of man with widely different qualities, bodily and mental, much in the same way as it has done with several closely allied species of the lower animals. When the qualities of different races of man are equal, no detriment results from their union. The mongrel French and English are equal to the pure breeds of Germany and Scandinavia. When, on the other hand, they are unequal, deterioration of the higher race is the inevitable result. When the disparity of races is extreme, no amalgamation at all takes place, for an antipathy is the result, somewhat similar to that which prevents admixture between closely allied species of the lower animals in the wild state. The Hottentots, the Caffres, and the Negroes of Southern Africa have lived immemorially side by side without crossing. The author then remarked that the antipathy of race is presented in the greatest intensity and on the largest scale in the new world, the highest and lowest types of man being there brought face to face. The author then alluded to the laws of several of the American states with regard to Negroes, and stated his opinion that it is the presence of this African race, too prone to live and labour in slavery or in social degradation, and utterly incapable of rising to an equality with the higher race among whom it has been planted, that has caused the present distracted state of the North-American continent.

Mr. CRAWFURD's Second Paper commenced with the *Mongolian Race.* As the race seems one throughout, although, by alternations of invasions and conquests, no doubt considerable intermixture must have taken place, no appreciable difference, whether in physical form or intellectual capacity, has followed. Towards the western frontier, however, there seems to have been some commixture with the Hindus,

as in the example of Assam; and, towards the Eastern, with the Chinese, as in the case of the people of Anam. The Indo-Chinese have, however, commingled with the Chinese in certain localities. The admixture, in these instances, is of comparatively modern date, not reaching further back than the first intimate knowledge of the nations of the far East by Europeans. It has arisen from Chinese emigration, originating in the pressure of population on subsistence. As is well known, Chinese emigration is, with very trifling exceptions, confined to adult males, and these always of the working classes, without leaders or capitalists. The immigrants get or purchase wives in the countries in which they settle, and the result is a mixed race, always educated as the fathers,—in energy and industry below the Chinese, but far above the Indo-Chinese. Fresh immigrants find wives among these half-castes; and in due time a population springs up little distinguished from the pure Chinese, except in the possession of a better acquaintance with the country and people they are planted among than the original immigrants. To the industry and skill of these colonists, for such they virtually are, are owing nearly all the staple productions of the countries in which they are settled ministering to foreign commerce. Within the vast bounds of China, the race of man, whether situated eight degrees within the tropic, or twice that distance beyond it, seems one and the same. What is true of China is equally so of Japan, over the whole of which one peculiar race would seem to extend, the exceptions being trifling, and consisting only of the aboriginal races inhabiting the island of Jesso and the Kurile Islands, with neither of which despised races do the Japanese appear to commix. The Japanese received letters and religion from China, but no evidence exists of a colonization of Chinese in Japan; and the wide difference, in manners, language, and institutions, which exists between the two races, would seem to indicate that no considerable intermixture ever took place. Indeed, from all we know of the history of the Japanese, an intimate connexion with the Chinese has ever been repugnant to them. I proceed next to take a glance at the commixture of races which has taken place within the vast insular region which French geographers have of late designated the Oceanic, as forming a fifth division of the globe. This great portion of the globe extends north and south from Formosa to New Zealand, and from west to east from Sumatra to within two thousand miles of the American continent. The most prominent aboriginal races existing in the vast region in question, are the Malay; the pigmy Negro of the Malay Peninsula and Philippines; the stalwart Negro, such as the

people of New Guinea, New Caledonia, and the Fijis; the tall brown-complexioned people, or Polynesians, of whom the Tahitians, Hawaians, and Maories are examples; and finally the Australians. All these differ so completely in physical form, and there can be no doubt of their being different races of men. The strangers that have intermixed with the aborigines consist of Hindus, Arabs, and Europeans of the north and south of Europe. Among the native races there has been little commixture, and, with partial exceptions, none to the extent of forming a permanent cross-breed. Between the pigmy Negroes and the Malayans, although dwelling in the same countries, sexual unions seem no more to take place than between closely allied species of the lower animals in the state of nature. It is stated, however, that between the tall Negroes of New Guinea, with its adjacent islands, and the Malayan settlers on their coast, a cross-breed has sprung up. The people of the Fiji group afford an example of a cross between the tall Negro and the Polynesian, a fact to which the personal appearance of the people, and their mixed language, bear testimony. When, within the Oceanic region, the race is found to be one and the same, a difference of language as a test of race must, as in other parts of the world, go for nothing. Thus the Malays, the Javanese, some half-dozen nations of Sumatra, a dozen of Celebes, and perhaps a hundred of Borneo, speak essentially different tongues, yet are of one and the same race, or at least differ no more from each other than do Europeans, African Negroes, Hindus, native Americans, or Chinese. The earliest strangers who mixed their blood with the people of the Oceanic region were the Hindus, and, as might be looked for, it was confined to the race nearest to their own country, the Malayan, never having reached the rude and remote Polynesians and Australians, a fact sufficiently proved by the total absence in all their tongues of any trace of a Hindu language. The number of the Hindu settlers compared with the indigenous people must in the nature of things have been small, and it follows that it has left no trace of the peculiar characteristics of the Hindu physical form. The only evidence of the intercourse consists in language and relics of Hindu religion and customs, with Hindu architectural monuments. These, however, are abundant, especially in Java and Sumatra, the nearest countries to Hindustan, and also the most attractive to the emigrant, from their extent, their fertility, and most probably also from their superior indigenous civilizations. Among European nations, the Portuguese and Spaniards, the latter more especially, are the only people who have intermixed to any considerable extent with the Malayan

race, and none have done so to any appreciable degree with any of the other Oceanic races. In Malacca and Timor, the only portion of the Malay Archipelago long held by the Portuguese, a cross-race has sprung up with so much of Malay blood as to be hardly distinguishable from the Malays themselves. In the Philippines a far more considerable population has arisen from the union of the Spaniards with the natives, known, as is the cross of the Red Man with the Spaniard, by the name of Mestizoes, or hybrids. We possess one unique example of a hybrid race from the union of the European with the brown Polynesian, and have the blood of the two parties of equal amount. This is the case of the mutineers of the Bounty, who settled in the little unoccupied island of Pitcairn in 1790. In 1793 the colony consisted of the following parties:—nine Englishmen, thirteen Tahitian women, and six Tahitian men, making a total of twenty-eight persons. In 1814 they had increased to forty-eight; in 1831, to eighty-seven; in 1853 to one hundred and seventy; and in 1862, removed to Norfolk Island, Pitcairn being found too small to maintain them, they had risen to the number of two hundred and sixty-eight, so that in seventy years time the population had multiplied full nine-fold. The Tahitian men left no offspring, and as neither European nor Polynesian has from the first joined them, they may be described as pure Mestizoes, or half-castes. When seen in 1814, a few of the members of this peculiar colony were of the dark complexion of the first mothers, but the majority, following the physical characters of the fathers, were not to be distinguished from the inhabitants of an ordinary English village. As at present settled in Norfolk Island, they are found to be wanting in the energy and enterprise of their paternal forefathers. A noticeable fact connected with this little community is the rapid increase of population, and this without any addition by immigration. It is a contrast to the stationary or retrograde state of population in the other islands of the Pacific. The difference, no doubt, has arisen from superiority of race and civilization; and although the last of these had no higher source than a midshipman and eight English sailors, it was sufficient to generate intelligence and industry, and to exempt the colonists from the social vices which elsewhere hinder the advance of population.

Professor Wilson said that he had devoted a great deal of time to the question of the mixture of races on the North American Continent. In the case of the Negro the subject was surrounded by so many social difficulties that so far as important ethnological results were concerned, it could scarcely be said to have had a fair trial. Not so, however, in the case of the red man. There was no legal impediment to marriage between a Red Indian and a white man;

some of the latter even boasted of their Indian descent. The colonists who went from this country to the North American Continent in the early years of settlement were generally young, unmarried men, who united themselves, either with or without marriage, to Indian women. In process of time there arose a vast population possessing English and Indian blood in their veins—such, for instance, as was found on the Red River settlement. These people possessed physical qualities of a high order—were persevering in the chase, and valiant in fight with their enemies. They were, however, to some extent, civilised, being chiefly Roman Catholics in religion, and no longer using the scalping knife upon their vanquished foes. When introduced into the society of Anglo-Saxons they frequently manifested very superior intelligence and ability, indicating no degree of inferiority whatever as compared with what was usually called the superior race. One of these persons had been under his (Professor Wilson's) instructions at University College, had taken his B.A. degree with honours in classics, and afterwards visited England as an agent of the Red River Settlements. Assuming that the Red Indian was an inferior race, and the Anglo-Saxon one of the highest types of man, the instance he had given would go to prove that the mixture of inferior and superior races did not cause either one or the other to deteriorate. The problem could not be tried to the extent to which it was desirable to carry it, as the white men had arrived in America in such vast numbers as to drive the aborigines before them; but it did not follow that the Red Indian disappeared because he was the inferior race. The Red River settlement was an illustration of the amalgamation of the two races without such deterioration, and he (Professor Wilson) believed that there was a much larger admixture of Indian blood in the white population of the American Continent than was generally supposed; and that this accounted for some of the peculiarities of the American, as contrasted with the European character. He believed that a mixture might take place between the white and the red race, with benefit to both. He thought that the same doctrine would apply with respect to the Negro and white man, though in that case there had not been so fair a trial as in the case of the Indian.

Mr. CRAFT said that being of African extraction, he felt called upon to make a few remarks upon the subject under discussion. He did not quite understand whether the author of the essay to which they had listened intended to say that no amalgamation had taken place between the Negro and the Anglo-Saxon race in the United States. He thought that Mr. Crawfurd had intimated that there was a very strong antipathy between the two races, and that the laws of the Southern States prohibited intermarriage between the Negro and the whites. He submitted that in spite of those laws there was a large population claiming affinity with both races. He thought he should be right in saying that nearly two-thirds of the Negroes in the Northern states of America had more or less of European blood in them, and he also believed that had it not been for that amalgamation, instead of there being 4,000,000 of slaves in those states there

probably would not have been more than 1,000,000. He would simply state, on behalf of the African race, that whenever they had had equal opportunities with the whites they had shown that they possessed considerable intellectual ability, and many of them had risen to very high position in society. He mentioned that, in order that persons who were not acquainted with Africans might understand that there was just as much difference between individual Africans as between individual Englishmen. He found that all Englishmen were not Shakespeares. He did not admit that Kaffirs were fair specimens of the Negro race.

Dr. JAMES HUNT agreed with the author of the essay in the general conclusions at which he had arrived, but he thought he had not dwelt sufficiently on the great physiological law which was admitted by most observers, that where the intermixture was kept up through succeeding generations the offspring gradually died out, and the race became extinct. He thought that the laws in the Southern states of America against the intermarriage of the negroes and the whites were wise laws, but he admitted that the subject was surrounded by considerable difficulties.

Mr. MARKHAM cited some instances from the Continent of South America, to prove that intermarriages between European and native American tribes tended to improve the intellectual and physical character of the population.

The discussion was continued by Professor Wilson, Mr. Carter Blake, Mr. Ralph Carr, and Mr. Craft.

Troops in India. By Dr. CAMPS (H.)—An analysis was given of the recent report on the sanitary state of our army in India. The conclusions drawn were:—1. That by far the larger proportion of the mortality and inefficiency in the Indian army has arisen from endemic diseases, and notably from fevers, diarrhœa, dysentery, cholera, and from diseases of the liver. 2. That the predisposition to these diseases is in part attributable to malaria, in conjunction with extremes of temperature, moisture, and variability. 3. But that there are other causes of a very active kind in India connected with stations, barracks, hospitals, and the habits of the men, of the same nature as those which are known in colder climates to occasion attacks of the very diseases from which the Indian army suffers so severely.

Dr. JAMES BIRD said that Dr. Camps's paper seemed to be an abstract of the Sanitary Commissioners' Report, which he contended—by leaving out the ratio between peace and war—was not correct in its statistics. The returns were mixed returns: it was absolutely necessary, in order to obtain a correct result, that the peace and war returns should be separated. He had no fear of the climate, if the sanitary measures necessary were carried out. Dr. Edward Balfour said, in 1849, that he differed entirely from Col. Sykes's conclusion, that intemperance and vice were the main causes of disease; and he

(Dr. Bird) differed from them also. The causes of the excessive mortality were heat, moisture, and localities. The Station Reports showed that; although vice and intemperance had their effect. The colonel seemed to think that the rate of mortality in India was 67·9. He had shown that in the last twenty-six years it had scarcely exceeded 44, and in the last five years it had not exceeded 35. He dissented from the colonel's opinion as to the excellence of the barracks. The great mortality was increased by ill-ventilated barracks, and the filthy cesspools in the midst of them. He believed the proper remedial measures applied to them would cause life to be preserved in India as well as in any other country. He held that the respiratory functions of the human body could be acclimatized to a warm region; but it was impossible to acclimatize any human body to miasmata; and he fully believed that, in order to lessen the mortality of the troops in India, it would be necessary to lay a good foundation for the barracks, and attend to their arrangements as carefully as those of workhouses and hospitals in this country were made.

Dr. James Hunt entirely disagreed with Dr. Bird on the subject of acclimatization. There was a physiological change produced; but it was not acclimatization, but the gradual production of disease. With regard to the fact of the mortality being chiefly put down to intemperance and immorality, he must say he could find no evidence of that. It was certain that in such climates as that of India, it was necessary for European inhabitants to take stimulants; the defence of teetotalism for India was objectionable. He held that there should be a judicious selection of men suited to hot climates; they could not preserve every one in health there. As for attempting to rear the children of European parents, the system was utterly false. Throughout the whole of Bengal, there was not the third generation of Europeans; the mortality among children was excessive, and, in fact, it was utterly impossible to rear children. His conclusion was, that the only way to cause a decrease of mortality among the troops, would be the selection of men suitable for the climate. By a study of temperaments and other peculiarities, it was possible to predict with a degree of certainty, which he found most surprising, what would be the influence of climate on different temperaments.

Colonel Sykes defended the Commission from the statements of Dr. Bird. For their reports they had the authority of a very great number of witnesses, and there could be no impeachment of the integrity of its members. Where great heat and moisture existed, disease prevailed; but he found that where great heat prevailed along with dryness, it was not detrimental to the health of the men. The great evil of the whole system, was the employment of European troops in such numbers without real necessity, thus causing an enormous amount of misery amongst the families of the labouring poor in England. That was what most of all he deplored. A very great deal of expense had been incurred in barrack accommodation; and he was still of opinion that vice and intemperance were fruitful sources of disease. After considering what we had lost, the question for them was, what were we likely to lose in the future? At all events, we

should preserve our power in India with the very smallest possible number of English troops; and he should even be inclined for us to run some risk for the sake of humanity, and for the preservation of the youthful blood and sinew of the country.

Dr. HANCOCK was of opinion that vice was a great source of the disease in India, but that was created in a great measure by the restrictions on marriage. The climate was not the cause. The arbitrary restrictions on the marriage of the men deprived them alike of friends and family, and they were driven to the vices which ultimately brought them to the hospitals.

Colonel BAKER thought that the conclusion drawn from the papers before them, that the average 67·9 per thousand was the true average of the mortality of troops in India, was erroneous. He maintained that the sanitary measures of the Government in India had been very effective, and had reduced the average mortality in time of peace.

Instinctive Actions. Dr. WM. MURRAY (D *a*) endeavoured to demonstrate the part which each of the sources of nervous power plays in generating those effects, which, in the aggregate, make up an instinctive act or set of actions. The author thought that the instinctive movements of animals, and their nerves or physical construction, do not differ from those of man in kind, but in degree. In man the volitional, as representing reason, abstract deduction, and experience, is immensely superior to the others. As we descend in the social scale, we find the emotional, as the originator of the purely and really instinctive movements, become more prominent, and generally carrying the will with it, for we very seldom see an animal going contrary to his instincts. Lower still in the scale, we find all the arts necessary to the life of the animal left to the care and control of reflex action. Was there, then, he asked, in animals an intelligence? And his reply was—We strongly incline to the belief that there is, and that it varies in its power with the kind of animal, and manifests its existence by the extent to which it controls the emotional or purely instinctive part of his actions.

Dr. B. W. RICHARDSON rejoiced that the time had come when the convictions of men of science could be freely expressed, and when they dared to assert that there was nothing in man that might not be understood. Physiologists ought not to admit that there was any hidden vital force or mysterious entity in man which could not be comprehended or explained. For his own part, he would go still further than Dr. Murray had gone, and assert every influence upon man to be from without. Men were moved and controlled by the eternal universe alone; and a Shakespeare himself, in grandest poetic effort, was but giving up through his hands that which he had received and concentrated from the universe around him.

On Life in the Atmosphere. By JAMES SAMUELSON, Esq. (D *a*.)—

No subject in natural history, he remarked, except the allied one, the origin of species, had of late excited greater interest in the scientific world than the origin of the lowest types of living beings on the globe; and although the problem was far from being solved, yet, the investigations that had accompanied the discussion had already served the useful purpose of throwing new light on the anatomy and life history of the mysterious little forms of which it treated. It was rather with the latter object, than in the expectation of being able to assist in the solution of the general question, that he ventured to lay before the association the results of investigations recently made. He had, for example, taken rags imported from various countries, and shaken the dust from them into distilled water, which he then exposed to the atmosphere; and, after describing generally the character of the living forms he had discovered in this pure water, he stated in detail the forms of life found in each kind of dust, and among these were some new species of rhizopoda and infusoria, and an interesting ciliated worm-shaped form, which he believed to be a collection of the larvæ of some other infusoria. The general results of the microscropical examination of these fluids between the 27th of July and 15 of August was as follows:—in the dust of Egypt, Japan, Melbourne, and Trieste, life was the most abundant, and the development of the different forms was rapid. In conclusion, he observed that if he was correct in supposing the germs of the living forms that he had described to be present in the dust conveyed by the atmosphere, and in distilled water, it was worthy of notice that these germs retain vitality for a long period, one of which he could not pretend to define the limit. In his experience they outlived the heat of a tropical sun, and the dryness of a warm room during the whole winter; but in Dr. Pouchet's case they retained their life 2,000 years, for he obtained his from the interior of the pyramids of Egypt, and then survived an oil of 400 degrees of heat. Mr. Samuelson endeavoured to disprove the theory of spontaneous generation. He suggested whether the great rapidity with which these germs are multiplied might not account for the spread of epidemic diseases. He did not profess to have any acquaintance with such diseases; but might it not be desirable to subject the atmosphere of hospitals to the microscopic test?

Dr. Rolleston attempted to ridicule the notion of spontaneous generation which certain French writers had propounded and endeavoured to defend.

Dr. B. W. Richardson believed it might yet be discovered that

certain diseases of an epidemic nature were produced by the infusoria of the atmosphere as suggested by Mr. Samuelson, and thought that the best way of arriving at some conclusion upon the subject would be by first removing all those diseases which all agreed could not possibly be so engendered, and testing the remainder. There would not be much difficulty in this, because all our known diseases did not exceed 279; and of these there were not more than ten or twelve not already accounted for. Many facts had been related confirmatory of the opinion that epidemic diseases were sometimes produced by inhaling dust filled with living creatures. On one occasion, for instance, three men were thrashing in a barn. In turning over a truss of straw some dust rose in their faces, and caused a slight irritation in the nose and throat. They thought nothing of it, however, but presently one of them said he felt cold, then another, and then the third; then one felt sick, and in the course of an hour they were all unwell, and on the following day all three were seized with erysipelas. Dr. Sailsby had recently made several experiments of this order. Some men were handling a tree covered with a fungus, when they were seized with symptoms resembling measles. The doctor first inoculated himself and then his children with the virus, and like results followed; they had the measles, or something very similar. The same facts had been observed by Dr. M'Donald, who had learnt of a case in which measles were produced in a boy by some slightly decomposed linseed meal having been thrown in his face. He strongly advised that the subject should be duly investigated.

Influence of high altitudes on man. (A.)—Mr. GLAISHER gave some account of the curious changes in colour that he and Mr. Coxwell experienced in ascending, and remarked that they could now go a mile higher without turning quite so blue as before.

Professor OWEN said he had attended the section chiefly in the hope of hearing from Mr. Glaisher something of the influences of these very high distances on the human frame, which was adapted, of course, to a very different medium. The fact which Mr. Glaisher mentioned as to his feeling a greater power of resisting the influence of very high temperatures was very interesting in physiology, and in relation to the series of facts with which they were acquainted. They knew their lungs did adapt themselves to atmospheres of different degrees of gravity, so that there were people who lived habitually on high mountains and felt no difficulty in breathing such as was felt at once when the inhabitant of a plain or low country came up to these elevations. Now, that depended upon the greater proportion of the minute cells of the lungs which are open and receive an attenuated atmosphere, in proportion to the minute cells that are occupied by a quantity of mucus. Those on the plain did not make so large a use of their breathing apparatus as those who lived at great altitudes. Hence more cells, occupied by mucus, would be taken up, and opened to free course and play; and he had no doubt that was the solution of the interesting fact mentioned by Mr. Glaisher. Physiolo-

gists were all agreed that one condition of longevity was the capacity of the chest, and therefore he hoped the increased breathing capacity acquired by Messrs. Glaisher and Coxwell would tend to the prolongation of their lives.

Mr. GLAISHER, alluding to what had fallen from Professor Owen, remarked that the adaptation of nature was certainly something wonderful. He had been in a position, anxious to remain, and though not a second was allowed him, he looked down, around, above, everywhere in a momentary glance, and everything became fixed on the retina with such ten-fold impressions that there were many of these scenes he could call to mind now, and could (if he were able to draw) reproduce them on paper. One sensation he found was that his arms were forced back and more air was taken into the chest. The eyes were clear, the brain active, and the powers increased according to the exigencies of the case.

On the aboriginal occupations of North Tynedale and Western Northumberland—an illustration of the social life of the Celts. By Rev. G. R. HALL. The present brief account embodies the results of recent researches connected with the aboriginal settlements of the western parts of Northumberland. The subject is one of more than local interest, as the ancient remains are concluded, with good reason, to be those of the earliest race of men who inhabited these islands, of whose social condition any trustworthy vestiges remain.

These dalesmen and mountaineers of a prehistoric Northumbria gave those names to hills and streams which are still current in the county. Its chief river—the Tyne—was so called long before the vanguard of the victorious Roman legions set foot upon its northern bank, or built the walls of Pons Ælii, on whose site this important town of Newcastle now stands. The name of the Tyne is usually derived from the ancient British word *tyn*, that is, the *double* river, in allusion to the two branches called the North and South Tyne, which form it.

The former branch, the North Tyne, is the larger of the two, both as to volume, and the distances from its sources in the recesses of the Cheviot range of mountains to its confluence with the sister-stream of the South Tyne. North Tynedale is about forty miles in length; and the area embraced in this notice of it, including the districts drained by its tributaries, is over three hundred square miles.

A few notes on the aboriginal occupation of North Tynedale, derived from personal research during the past and the present year, may not be devoid of interest in connection with the Geographical and Ethnological sections of the British Association.

Two kinds of ancient British caerau, or fortified towns, may be

named the hill forts and the lowland fastnesses. They are located in the strongest positions, on the top of lofty upland ridges, crags, or rounded heights, in the case of the former; and the latter occupy advantageous sites on escarpments and platforms of the lower grounds, generally flanked by deep ravines and the precipitous banks of the numerous mountain streams in the river basin itself. In one instance, the middle of an inaccessible morass or bog has been chosen near the basalt cliffs at Sewingshields; and at Bridge House, near Wark, another singular site has been selected in the hollow or sinus, shut in on every side, the remains of which are still called the "Campsteads," as the oppida, or towns themselves, are commonly termed "camps" by the dalesmen; perhaps from having been used as encampments in the mediæval border forays and conflicts.

One of the finest examples of the hill-fastness of the aboriginal Britons of this district is found on Warden Hill, overlooking the junction of the South with the North Tyne. Its height above the sea, about 600 feet, gives no inadequate idea of the extensive view obtained from this spot, and of its consequent importance as a post of observation. It commands a prospect of many miles of each of the three valleys to the north, west, and east, as they spread out beneath the eye of the spectator like radii from a common centre. The ancient town of Hexham is in the lower foreground. A broad expanse of the undulating uplands on every side can be discerned. No neighbouring eminence commands it. All around the ground slopes gently or abruptly from the apex of the hill on which the fort was built. Its area, including the three concentric ramparts by which it has been defended, is about two acres. Within these outer defences some of the aboriginal dwellings or house-circles may be traced. On the opposite bank of the North Tyne, south of the line of Hadrian's vallum, stands another fortress, built—like most of the settlements which I have noticed in the district—of massive unhewn blocks of the native freestone. If we follow the upland "wastes," the "vastæ" west of the river, which Camden tells us were inhabited in his time, as they were no doubt in the pre-historic period, by a race of nomades, half shepherds and half soldiers, "*militare genus hominum*," a few noteworthy forts can be seen, besides two or three situated to the south of the Roman Wall, the principal of which was the strong hill-fastness of Barcombe. At Sewingshields, Lonbrough, the Catlass Ridge, and Roses Bower or Wark's Burn, at Bridge House, the Stone Folds, and Leek Hill, and Hindridge, we meet with these primitive fortifications; vestiges of whose Cyclopean walls, less or

more perfect, still remain. On the eastern bank of the river, North Tyne, and the banks of the Rede, several of these hill-fastnesses exist; as Errington Hill Head and High Shield Green "Night Folds," wherein, as we may suppose, from this traditional name, the aboriginal herdsmen, like those of Casivellaunus, when threatened by the advance of Cæsar's hostile legions, were wont to secure their flocks and cattle, brought in from these upland pasture grounds (which are still noted in these parts as an excellent "summer feed") and thus protected them from the ravages of wolves and night robbers. A chain of these fortresses again, crown the elevated ridge near Otterburn, one of which was occupied by the Scots in 1538 before the famous battle of Chevy Chase, between Douglas and Percy, was fought.

We may now turn to what I have called the lowland fastnesses of the aboriginal Britons, that is, the towns whose sites are on the declivities of the valley itself.

In former times the margins of the rivers North Tyne and Rede were clothed with abundant vegetation, and many picturesque remains of the primeval woods continue to adorn these valleys in the neighbourhood of Keilder Castle, Heselyside, and Redesmouth. In clearings of the forests the aboriginal inhabitants appear to have had numerous settlements in this district. Near Keilder some very perfect examples may be noticed, where eleven of these towns existed. Amongst these the double fort, popularly known as "Bran's Walls" (a name which calls to the mind the famous Celtic chieftain of later days, Bran Galed, or Bran the Hardy) is worthy of inspection. This stronghold occupies the slope of a hill overlooking the sources of the Keilder river, and is situated in the midst of a vast amphitheatre compassed by wild heather-clad mountains, of which Pell Fell, 1,290 feet above the sea level, is the highest. The shape is that of two irregular ellipses, closely connected with projecting works, covering together about an acre of ground. Eleven hut-circles, or dwellings, can be plainly traced within, their average diameter being about twenty-four feet. The Bell's Hunkin fort, in the North Tyne Valley, about one mile west from Keilder Castle, is also in excellent preservation. It occupies a strong defensive position on the brow of a deep ravine, the site being covered with a natural growth of the birch and alder, and mountain ash. A vallum, constructed of large stones, surrounds it, but there is no fosse. The vallum rises in some places to the height of seven feet, and within it I noticed five circular foundations of primitive dwellings, measuring five, six, seven, ten, and eleven paces

across, respectively. This stronghold is erroneously spoken of by the dalesmen as a Druidical circle or temple, of which none now exist in the valley, though Wallis mentions one as having stood near Nunwick, and tradition points to another, where a solitary pillar of basalt stands near the village of Barrasford, to which a wild legend, like the Breton folklore, representing the "Palet de Gargantua," or Gargantua's quoit, is attached. A group of aboriginal fortified towns, equally numerous, exists in the vicinity of Birtley, at the angle formed by the confluence of the North Tyne and Rede. In an area of about twenty square miles I have noticed nearly as many ancient forts, situate on the declivity of the valleys west of the watershed of the Wansbeck river and the line of the Watling Street. Within a radius of two miles from Birtley six aboriginal settlements occur. The chief of these stands on a wedge-like platform, in the Countess Park Woods, strongly defended by two concurrent ravines. The site covers, including the outer ramparts and fosse, more than three acres. It is traditionally the site of a great battle in the "troublesome times," which, as this popular term implies, have left an indefaceable memory behind them. This fastness is well worthy of inspection. It is the largest and one of the most perfect illustrations of this class of these primitive works to be found in Northumberland. One of the circular huts, perhaps the residence of the chief, is of extraordinary dimensions, being forty-six feet in diameter. The foundations of the inner and outer ramparts—which are several feet high in some places—and of the dwellings within, are plainly visible. In shape it is irregularly rhomboidal—that is four sides in straight lines, well rounded off at each corner. This and the neighbouring strongholds in the valley-basin would originally correspond very closely to Strabo's description, who informs us that "the woods of the Britons are their cities, for when they have enclosed a large circuit with felled trees, they build within it houses for themselves, and hovels for their cattle." This is analogous to the practice of Englishmen of the present day, who find themselves obliged to inhabit the backwoods of Canada, or the bush of the great Australian continent. The materials used in the construction of the lowland fastnesses, as well as of the hill fortresses, so far as I have noticed, are the native freestone. Only in one instance of a series of towns on the southern slope of basalt crags at Gunnerton, has the whinstone been used. Both are built up into Cyclopean walls of unhewn but massive stones. I have observed in several sites traces of the action of fire, the white freestone having become reddened, a proof of a long occupation by the aborigines. The hut-

circles seldom vary in form, generally retaining the round shape of the primitive moveable tents of the nomadic races, of which these are continuations and reminiscences. Probably the foundations only were of stone, and the walls, ten or twelve feet high, with conical roofs, were of wattle work, roughly stuccoed perhaps on the outside, and with the skins of wild beasts, the spoils of hunting, hung within. Bede describes such a dwelling of the Britons of the seventh century, when he tells a story (*Eccles. His.* chap. 10, p. 125) of a pilgrim returning from King Oswald's grave at Maserfield, who being benighted seeks hospitality therein. The house was of wattle work chiefly; and he tells us that, after much feasting, some spark ignited the roof, where the only opening for the admission of light or the egress of smoke was situated. The British maidens were adepts at twining with their slender fingers the withies that grew by the margin of the streams and ponds into such wattle work. Their basgeds, whence our word basket, were known and valued even in the Imperial city of Rome. Circular and square huts, such as existed in Gaul, are represented on the Antonine Column. The aborigines of the North Tynedale district and the west of Northumberland were evidently somewhat above the condition of savages. They did not wholly depend for subsistence on the casual produce of the chase. At three different places a series of terrace-lines or platforms, raised one above the other, still remain in the vicinity of the ancient towns. Near Falstone, and at Birtley, they can be plainly seen. In the latter district the forts are numerous, two declivities are, as it were, furrowed by these lines of primitive culture. One, near to the Countess Park "camp," consists of eight terraces. But the largest is on the slopes of the elevated ground above the Cary House fort. The latter is in the form of two sides of a parallelogram, which, if defined on the other sides, would enclose an area of ten or twelve acres. Six terraces face north-west, running about four hundred and fifty yards, and meet the other lines, which are about half this length. Each terrace varies in height and breadth, from ten yards to a few feet broad, and in some places they are ten feet high. Here the corn, to supply the tribe with a store for present or future use, was grown. The querns, or hand-mills, were used to prepare it, of which many specimens have been found of granite and other hard materials, on different sites. Within the memory of very aged men these hand-mills were still used.

Another noteworthy feature of the district consists in the immense heaps of slag or scoriæ of iron, which I have met with on the slopes

of the vale of the North Tyne. Many hundreds of tons of this refuse from ancient ironstone smelting may be seen in a woodland glade near Birtley, and close to two primitive forts and the last named range of terrace-lines. They are still called the "Cinder Kiln Hills."

Iron exists in abundance almost at the surface of the ground. This is proved by the number of chalybeate springs, and the fact that the smaller drainage tiles are soon rendered useless by the speedy incrustation of oxide of iron that gathers on the inner surface, from the water which holds the iron in solution. From these workings, no doubt, the long, pointless swords of the ancient inhabitants were derived, though their manufacture was rude enough, from the excessive waste evident in the process. Iron spear heads have been found on the sites of some of the forts in the Keilder district. But the flint arrow and spear heads, of which a manufactory, as I consider it to have been, was noticed in removing, for purposes of tillage, the stones of a fort near Wark village, seem to have been the usual weapons previous to the Roman-Celtic period. A copper battle-axe, with beautiful scorings, was discovered, however, last year near Corbridge.

The last class of aboriginal remains to be noticed consist of the crugan, barrows or burial mounds. Several mounds of interment have existed either within or at the chief entrance of forts, which are, as usual, facing the east, the cardinal point of the heavens to many primitive races, as the north is to us. Thus at Warden Hill, outside the entrance, is a large tumulus; and in the Carey House fort, near Birtley, a kistvaen, or four upright slabs in the shape of a chest, containing a scored vase, with the ashes of some chieftain whose body had been burnt, was found by some men draining the site a few years since, who at first fancied the vessel contained hidden treasure. On the level platform above the High Shields Green "night folds" are numerous mounds in the midst of the traces of ancient culture, evidently of later date than the mounds themselves. Under each of these, tradition asserts that a warrior sleeps. The largest is called Dan's Cairn, a reminiscence, perhaps, of the terrible era of the Danish incursions into Northumbria. But the most remarkable of these tumuli exists near Gunnerton, in the neighbourhood of the "Camp Hill," where a fort has stood, noticed by Mr. MacLauchlan. The barrow itself has not been noticed or described. It is a conical mound, thirty feet high, surrounded by a deep fosse and vallum, with covered way leading to the stream on whose precipitous banks it stands. The circumference is about one hundred paces. A wild legend, like those of the Scandinavian Sagas, is connected with it of

some supernatural being, usually termed a dragon, keeping watch over a secret hoard at its centre. At some distinct date there has been an attempt to learn the truth of this tradition. The mound, which is still called the Gunnerton Money Hill, has been scooped out to a considerable depth from the top and eastern side.

These castrametations—terrace lines of field culture workings for iron—and burial mounds are the chief vestiges remaining in this part of Western Northumberland of its aboriginal inhabitants. They are interesting relics of a departed race who peopled this island in times before the dawn of history. When we ask who the builders of these cyclopean structures were, and when they lived, we are unable to give any definite reply. Most probably they were a portion of the Japhetan family, who, as Mr. Wright informs us, first overspread the countries and islands of Western Europe. When we compare the characteristics of these early remains with those by antiquaries elsewhere in England and Scotland, we may, perhaps, conclude that these ancient Northumbrians were of the Celtic race. If we follow the guidance of Ptolemy and other ancient geographers, we may further decide that the tribe or nation was that of the Gadeni, whose exact tribal boundaries are not accurately ascertained, but who appear to have peopled the western parts of Northumberland, the small portion of Cumberland north of the river Irthing, the western part of Roxburghshire, the whole of the county of Selkirk, with Tweeddale, a great part of Mid-Lothian, and nearly all West Lothian. This warlike and powerful tribe had the Brigantes as their neighbours south of the Tyne, and the Ottadeni eastwards on the coast of the German Ocean. These wild, inaccessible regions of mountain and moorland were well calculated to develope a spirit of bravery and independence. And thus we find that when the Emperor Severus invaded these parts, his legions were appalled at the strength, activity, and ferocity of the Northern Britons.

From a comparison of the materials used in the construction of the hill-forts and lowland fastnesses of this district, and their general conformation, I cannot find any sufficient warrant, as far as this region is concerned, for the supposition entertained by the Rev. W. Barnes (*Notes on Ancient Britain*, p. 41), that the two classes of fortifications were built and occupied at different, and perhaps, widely distant times. He remarks, "These wood-fastnesses (of which Cæsar and Strabo speak), seem to have been the trefydd in the lowlands and nor the caeran of our hills, which might have been antiquities even in those days"—the days of the Roman invasion and colonization of Britain.

As to the social life of these remote times, perhaps, the closest analogy and resemblance will be met with in the condition of the North American Indians, amongst whom Dr. Wilson (*Prehistoric Man*, vol. i, chap. i, p. 6) conceives that he has found "the living present of the long obliterated past of the Allophylian of Britain's prehistoric ages."

Mr. GEORGE TATE, F.G.S., etc., said that, having for several years investigated the early antiquities of Northumberland, he would respond to the call of the president. The paper read, gave an interesting description of the relative position of several of the ancient remains in Tynedale; but the author had not produced the best kind of evidence to support his speculations; nor did he seem acquainted with the facts elicited by better methods of investigation, than he had adopted. If we are to arrive at satisfactory conclusions as to the age of such antiquities, and as to the character of the people of whom they are the remains, archæologists must follow the course pursued by the geologist, who is not content merely to look at the outside of a rock and then to speculate on its age and origin; but, with hammer in hand, he will spend days and even weeks in breaking it up to find the organisms it contains, and from these he can arrive at sound conclusions both as to its age and the conditions under which it was formed. In like manner, must the antiquary condescend to use the spade and the pickaxe, to open the barrow and clear away the *débris* from ruined hut and camp, so that he may find relics which may throw light on the age of the structure and on the character of the people to whom they originally belonged. By this method, extensive explorations were made during the summers of 1861 and 1862 into the ancient British remains among the Cheviots, in the valley of the Breamish and on Yevering Bell and its neighbourhood. The Berwickshire Naturalists' Club were enabled to make these investigations, through the liberality of His Grace the Duke of Northumberland; and two reports have been printed in the *Transactions* of that body, giving an account of the explorations. Before referring further to these, I may notice that the author of the paper speaks of a copper battle-axe found near Corbridge; but this instrument is a bronze celt, peculiar for its ornamentation, but not found in association with any ancient British remains. He also calls a house described by Bede, British, while there seems to be little doubt of its being one of the ordinary Saxon dwellings. The ancient British remains examined by excavations, were in the wild hilly districts of North Northumberland, and consisted of fortified towns, the oppida of that people, great forts which crested the higher hills; smaller yet strong fortlets on the slopes of the hills and in the high valleys; hut circles, which were within towns and forts and scattered around the lesser fortlets; and barrows, the sepulchres of this people. A fortified town and ancient British oppidum, at Greaves Ash, near Linhope, is the most remarkable of these antiquities; its ruins cover an area of about twenty acres. Situated in the valley of the Breamish, on elevated ground, tolerably

level, and with the high hill of Greenshaw sheltering it on the north; it consists of three principal parts at a little distance from each other, but all so connected by intervening buildings and defensive works as to form one town. The most important of these divisions consists of a number of hut circles, within a large circle, defended by two massive stone walls, one being from five to seven feet, and the outer one being from ten to twelve feet in thickness, and nearly a thousand feet in circumference. The explorations revealed peculiarities of structure in these great cyclopean walls, which are fully described in the published reports. The walls of the huts exhibited the same kind of masonry; for the most part, they were quite circular, varying in diameter from eleven to twenty-seven feet, each with a well-formed entrance facing the east or south-east. Many of them were flagged with flat porphyry stones, and, in some cases, a raised row of stones across the entrance had acted as a check to a door which had opened inwards. The fire had been in the centre, as hearthstones were noticed still retaining the marks of fire, and in a similar structure near Yevering, charred wood was discovered on a central hearthstone. In one hut a rude low stone bench was observed, which may have been used as a bed. Some portions of the great defensive walls still remain five feet in height; and in some parts the walls of the hut circles are from two to three feet high. Originally, the former may have been from eight to ten feet, and the latter as much as five feet in height, probably a tapering roof, of timber, wattle-work, and sods or rushes rested on the walls of the huts. Forts, strong from their natural position, and from the thickness of their ramparts, crown many of the higher hills; perhaps the most remarkable is that of Yevering, a fine conical hill about fifteen hundred feet high. The summit is girt round by a thick wall, now broken down, enclosing an area, one thousand yards in circumference. Wild fancies were entertained by the antiquaries of last century respecting this place; it was with them a Druidical temple, and one, of keener sight or stronger imagination than others, saw an altar stone with the marks of fire, which had burnt human victims. Such notions are entirely groundless. Too high and exposed to be suited for permanent residence, Yevering might be occasionally inhabited during the summer, but like others in similar situations, it was a place of refuge and defence for the people inhabiting the valleys, when they were attacked by a too powerful enemy. The people lived on the slopes of the hills, and in high and dry valleys between these hills, in circular huts, protected partly by smaller strongholds, the residences of the chiefs. These strongholds or fortlets were from thirty to one hundred and fifty feet in diameter, with thick walls similar to those at Greaves Ash; and the huts were scattered around them; some of which were little more than pit dwellings, dug out of the hill-side. The antiquities described, in the paper read, are similar to those among the Cheviot hills; and it is noticeable, that they are similar to what are found in the south-west of England, in Cornwall, and in some parts of Scotland, leading to the inference, that, at an early period, the whole of the island was occupied by the same race. The arrangements, however, tell of a divided state of

society—of separate tribes and clans, often at war with each other. Exposure to similar dangers in different periods, causes the adoption of similar methods of meeting these dangers, modified, however, by different degrees in civilization. The relation of the several kinds of antiquities to each other seems analogous to what we have in the middle ages on the Borders, where there was almost constant warfare. The great hill forts are like the baronial castles; and as the cottages of Northumbrians nestled under the protection of the mediæval pele, so were the ruder huts of the ancient Britons scattered in the valleys around or near to the strong fortlets. It has been asked what is the age of these antiquities. Sir Gardner Wilkinson is of opinion that the ancient Britons, alarmed by the first invasion by the Romans, erected such strong fortifications as that at Greaves Ash to protect themselves against this new and formidable enemy. Taking, however, the relics discovered as a guide, as well as peculiarities of structure, I think, they are referable to a much earlier period. Both in the valley of the Breamish, on Yevering itself, and in the fortlets in the valley, several flint weapons and instruments and a quantity of broken pottery of the coarsest kind were found; in one of the huts was discovered a portion of an armlet of white opalised glass, similar to some obtained in Switzerland, belonging to the so-called bronze age, and similar to others from Scotland, taken out of a moss, and from under a cairn. A portion of an armlet of variously coloured glass was got out of a hut at Yevering, and a fine green glass bead out of a hut in the Breamish. Other armlets made of polished oak were in a hut on the top of Yevering. And within the same great fort was found a copper pin, which appeared to have been part of a fibula. There were no golden ornaments. The bones of a horse and the horns of the red deer were found in the valley of the Breamish. When these cities, forts, and dwellings were first constructed, the ancient Britons were far from being in a savage state; they had a rude civilization of their own, and had made some advance in art. Though their glass ornaments may have been imported from Phœnicia, they made their own bronze and flint weapons and instruments, and their domestic vessels of clay. Hunters they were doubtless, and keepers of cattle; but some of them, at least, had settled within walled towns, and were, to some extent, employed in cultivating the soil and raising corn—probably oats, for from the teeth of an Ancient Briton, taken out of a cist at Tossin, being worn flat in the crown, he may have lived upon hard vegetable feed. Numbers of querns of a primitive type, found over the district explored, prove that corn was ground and used; and as the under stone of one of these querns was found, as a flag in a hut, we have evidence of the use of hand-mills by the early occupants. Terraces on the hill sides, the most remarkable of which are at Heathpool, seem to me to mark the spots of this ancient cultivation, which indeed could only be carried on at moderate heights among the hills, since much of the lower parts of the country would be covered with swamps and woods. Two reasons would cause cultivation to be practised on horizontal terraces at an early period. Less mechanical power would be required to form ridges along the

side of the hill, and the heavy rainfalls of the mountainous regions would be less liable to wash away the soil from ridges that were horizontal, than from those up and down the hill. Many barrows had been opened; and in one of them near to Yevering Bell, an interesting discovery was made, tending to prove that iron was known to, and used by the Ancient Britons, at a period earlier than archæologists are willing to admit. In this barrow, along with flint weapons and instruments, and potsherds, some lumps of iron slag were found; and this discovery throws some light on the origin of heaps of iron slag, which I have met with in several places in the wild moorlands, distant from modern habitations. Respecting them there are no traditions, and connected with them are no remains of furnaces or other buildings; but they are not far distant from ancient British camps and forts. It is, therefore, not improbable that these heaps mark the spots where ancient Britons smelted the iron-stones of the district. In a cist at Tossin an iron weapon was found, associated with urns scored with the zigzag pattern, characteristic of ancient British interments. Of this I have given a description in the *Proceedings* of the Society of Antiquaries for Scotland. Probably enough, iron was more in use than is generally supposed; for from its rapid oxidation, it is only in very dry situations that it can be preserved. Such facts throw serious doubts over the Scandinavian classification of antiquities into stone, bronze, and iron ages. Certainly they can apply only in a very general and indefinite manner to Northumberland. Weapons of stone, wood, or bone may in many parts of the world have been used before those of metal; but it is not certain that metals were unknown in any period of British history, and it may be that the material used would depend much on the means of the individual; while the chieftain could procure the bronze sword or spear, or even the more valuable iron weapon, his humble follower may have been unable to obtain any better than one of wood or stone. I am inclined to conclude, that the remains we have been discussing belonged to the Celtic race, such a swere in possession of the island when Cæsar invaded Britain. Of any preceding race we have no evidence in Northumberland. No kumbecephalic skull has ever been discovered. All that I have seen or heard of were of the brachycephalic form, which I regard as the true type of the Northumbrian Celts. These few expositions may, I hope, give some idea of what has been done in the investigation of early antiquities in Northumberland; and I must say, that if we are to make any real progress, archæologists must carefully gather facts by actual labour and excavations among the interesting remains which abound in this county, and from these we may eventually be able, by inductive reasoning, to obtain a clearer and more extensive knowledge of primeval history.

Antiquities of the Orkneys. By Mr. GEORGE PETRIE. The author stated that no district of similar extent in Scotland possessed so many aboriginal remains as the Orkneys. These remains were

found in almost every island, and new discoveries were continually occurring. They frequently appeared as green tumuli of various sizes, and sometimes were unexpectedly met with beneath the surface and without any external indication of their existence. The ante-Norwegian antiquities of Orkney might be classified as—1st, Dwellings and other Buildings of Primitive Architecture; 2nd, the so-called Picts'-houses or Pights'-houses; 3rd, Barrows or grave-mounds and ancient graves unconnected with barrows; 4th, Miscellaneous antiquities, such as standing stones and cromlechs. The paper gave a general description of the first two of these classes. The dwellings were subterranean chambers or cells, and brochs or circular towers; while the character of the so-called Pict's-houses the author believed to be sepulchral, and if so they might probably belong to the same race who erected the brochs, and it might be the standing stones also. The author exhibited various ground plans and sections of the ancient buildings, and concluded with a hope that future researches would throw more light on so interesting a subject.

On the Recent Discovery of Lacustrian Human Habitations in Wigtonshire. By Lord LOVAINE. Dowalton Loch, in which the structures about to be described were discovered, is a sheet of water of very irregular form, about two miles long and half a mile broad, situated in Wigtonshire, on the west coast of Scotland, at the end of a narrow valley five miles in extent, the whole of which is occupied by a moss, part of whose waters flow into the loch, and the remainder into the sea near Monreith; the elevation of the water-shed near the middle of the valley being almost imperceptible. Sir William Maxwell, of Monreith, has effected the drainage of this loch at his own heavy expense, to the great benefit of his neighbours as well as himself, by a cutting at its southern extremity of no less than twenty-five feet deep, for a considerable distance through the wall of whinstone and slate that closes the valley. The water having been partially drawn off, the bed of the loch exhibits the appearance of an immense sheet of mud, surrounded by beaches of different elevations, covered with large rolled stones and angular blocks of slate. It contains a few small islets, composed apparently of the same materials as the beaches. Sir W. Maxwell, having heard that a bronze vessel had been found in the mud near the southern shore, succeeded in obtaining it, but could not trace other articles of the same description reported to have been found near it. On visiting the spot, 19th August, 1863, to obtain further information, I observed some timbers standing

on an island near the centre of the loch, and was told that some one had been there in a boat when it first appeared above water, and had found bones, a small granite quern, and piles, and a spot was pointed out to me at the extremity of one of the little promontories where similar piles were observable, which, on inspection, I found to be true. These piles varied from a foot to eighteen inches in circumference. Sir W. Maxwell's bailiff, Mr. Chalmers, who displayed great zeal and intelligence throughout these researches, having proceeded to the spot to secure labourers for the next day's search, reported that, though it was not possible to reach the larger island, a smaller one was accessible, and that a canoe lay near it. On reaching the island over about forty yards of mud, I found it nearly circular, about thirty-eight yards in circumference, and thirteen in diameter. It was elevated about five feet and a half above the mud, and on each side of it were two patches of stone, nearly touching it. On the north side of it lay a canoe of oak, between the two patches, and surrounded by piles, the heads just appearing above the surface of the mud; it was twenty-four feet long, four feet two inches broad in the middle, and seven inches deep, the thickness of the bottom being two inches. On removing the stones which covered the surface, several teeth, apparently of swine and oxen, were found; and I proceeded to cut a trench round the islet, and upon coming to the southern end, a small quantity of ashes were turned up, in which were teeth and burnt bones, a piece of a fine earthenware armlet of a yellow colour, and a large broken earthenware bead, striped blue and white, together with a small metal ornament, apparently gilt; two other pieces of an armlet of the same material, one striped with blue and white, were also found on the surface. On cutting deeper into the structure (the foregoing objects having been found on the outside about two feet from the top), it proved to be wholly artificial, resting on the soft bottom of the loch: the uppermost layer was a mass of brushwood about two feet thick; beneath it large branches and stems of small trees, mostly hazel and birch, mingled with large stones, evidently added to compress the mass; below that were layers of heather and brushwood, intermingled with stones and soil, the whole resting upon a bed of fern about a foot thick, which appeared in all the structures examined to form the foundation. The whole mass was pinned together by piles and stakes of oak and willow, some of them driven two feet and a half into the bottom of the loch, similar to those above mentioned. The islet was surrounded by an immense number of these, extending to a distance of twenty yards around it; and the

masses of stone, which were apparently meant to act as breakwaters, were laid amongst them. The one next examined stood about sixty yards off, at the extremity of a rocky projection into the loch, but separated from it by the now hardened mud. It was smaller, and the layers were not so distinctly marked, and some of the timbers inserted in it under the first layer of brushwood were larger, and either split or cut to a face. A stake with two holes bored in it about the size of a finger, a thin piece of wood in which mortices had been cut, and a sort of box, the interior of which was about six inches cube, with a ledge to receive the cover, very rudely cut out of wood, were found. I succeeded two days afterwards in reaching the largest islet in a boat. It appeared by measurement to be three feet below the level of the other islets; but it was much larger, and several depressions on its surface showed that it had sunk. Wherever the soil was not covered with stones and silt, teeth were scattered all over it. We found quantities of bones at different depths in the mass, but always below the upper layer of faggots, and towards the outside. The progress of the excavation was very soon stopped by the oozing in of the water; but a workman, plunging his arm up to the shoulder into the soft material, brought up handfuls of the fern layer, mingled with sticks and hazel nuts, and large bones, believed to be those of oxen. Near the spot lumps of sand and stone fused together were picked up. On the south side of the island extraordinary pains had been taken to secure the structure; heavy slabs of oak, five feet long, two feet wide, and two inches thick, were laid one upon another in a sloping direction, bolted together by stakes inserted in mortices eight inches by ten inches in size, and connected by squared pieces of timber three feet eight inches in length. It extended to the length of twenty-three yards, and its base, about five yards beyond the surface of the mud, was formed of stems of trees laid horizontally, and secured by stakes. In other respects the formation resembled that of the other islet, but it was far larger, measuring one hundred yards round by about thirty-six yards across. No building of any sort was discovered, but a large plank of oak, twelve feet long, fourteen inches broad, and seven inches thick, lay covered with stones on the north side. The sinking of the mud had by this time laid bare a second canoe between the islet first examined and the shore; it was eighteen feet and a half long, two feet seven inches wide, and barely two inches deep: a block of wood, cut to fit a hole left probably by a rotten branch, was inserted in the side, two feet long, seven inches wide, and five and a half inches thick, and had there been secured by pegs driven through the side; across

the stern was cut a deep groove to admit a backboard. A hole two inches in diameter was bored at about one-third of the length of both canoes in the bottom. This was so rotten that it would not bear my weight without breaking. The next day, being unable to reach the last mentioned island, I found upon the spot which had been indicated to me on my first inquiry no less than six structures, similar to those before described, in a semicircle. They were, however, much smaller, apparently single dwellings. Though upon some of them charred wood was found, nothing else was discovered except a morticed piece of timber, which might have drifted there; and in one, inserted under the upper layer of brushwood, a large oak timber, measuring eight feet long by three feet in circumference. Throughout these investigations no tool or weapon of any sort has come to light. In the layers the leaves and nuts were perfectly fresh and distinct, and the bark was as plainly distinguishable on the stems and timber as on the day they were laid down, as were also the heather and the fern. It is difficult to conjecture the state of the loch when these edifices were formed, and whether or not they were completed at one period. The finding of the large stones in the layer of ferns might lead to the belief that they were gradually raised as the waters of the loch increased, and the necessity of strengthening them by breakwaters would seem to prove that the loch must have risen considerably before they were abandoned. No other sort of building has been discovered on them; but the great number of teeth scattered over the surface of the larger island, and even on the mud surrounding, and the immense expenditure of labour indicated in the shaping and hewing of the large timber with tools, which must have been from the work produced of the rudest description, betoken apparently a considerable population. The loch must have remained for a considerable period at each of the different levels before mentioned; at one time six or seven feet above its last level (that is, before its drainage was effected), to which it was reduced by three cuts made to feed neighbouring mills, one certainly of great antiquity. At three feet and a half below the ordinary level there are unmistakable appearances of a former beach, with which the top of the first mentioned islet almost exactly coincides. It is remarkable that, though there are many rocky eminences in the bed of the loch, none bear token of ever having been used for the erection of these dwellings, which seem to have invariably been based upon the soft bottom of the loch, where the intervening mud and water may have afforded the inhabitants a greater security from attacks from the shore. I had not time to examine fully the shores of the

loch, but I was assured by Mr. Chalmers that he had examined them carefully without finding traces of other structures. On a hill to the south there are remains of a Danish fort (*i. e.* a circular entrenchment); and the very ancient ruin called Long Castle is on an adjacent promontory on the north side.

Since writing the above, a very old man in Sir William Maxwell's service told me that in clearing out a channel between a small wooded island in Myston Loch, close to Monreith House, and the beach, he remembers there being found layers of timbers, piles, and flat stones laid in circles. I have also obtained from a farmer living near Ravenstone Moss a paddle of black oak, three feet long, fourteen inches broad, and one inch thick, which with four or five others he had found in that moss, lying close to a mass of timbers about six feet from the surface; this I have every reason to believe formed part of a structure similar to those described. I should have mentioned that, though retaining its shape, the timber is for the most part completely decayed, except where it has been protected from the action of the mud.

Dowalton Loch lies one mile to the left of the highroad, half-way between Wigton and Port William. The name of the loch is probably derived from the MacDowals, formerly lords of this part of the country, and possibly of Irish origin, constant communications with the north of Ireland having taken place from the earliest period. Sir William Maxwell suggests as an easy explanation of the different levels found in the loch, that the waters originally discharged themselves into the sea from the western end of the valley, a portion of them only now finding an exit that way, in consequence of the formation of the moss towards the centre of the valley, which compelled the remainder to flow into the loch. In this case the structures must be supposed to be formed in the early stages of the growth of the moss, whilst the loch was so shallow as to make it easy to raise the moss above its waters, and yet deep enough to float canoes, and afford the desired security from an enemy,

Professor Wilson said that a good deal of attention had been paid to this subject by Scottish antiquarians; and Mr. Joseph Robinson of Edinburgh had collected a great deal of important information, showing that a large number of lacustrian structures existed in that part of Great Britain. In a communication from Kincardineshire, addressed to the Earl of Buchan during the time he was president of the Society of Antiquaries, there was a description of a lake in which there were lacustrian habitations. There was also a description of numerous bodies of animals, and of various bone ornaments. Two of

the latter are still preserved in the Museum of Antiquaries, one of them being a plain circular disc, and the other an elaborate interlaced ornament. Similar ornaments were found in early British graves. He was justified in saying that the subject was a very interesting one, particularly at the present time. The opinion he had formed in relation to the discovery of bronze and of metals generally, was that they belonged to a much earlier period than antiquarians had hitherto been disposed to assign to them. The discovery of flint instruments in Suffolk, and the more remarkable discovery in Gray's Inn Lane, London, were altogether free from the supposed difficulties or doubts of modern speculation; and, therefore, were of special importance in the present stage of the argument.

Sir CHARLES LYELL said he thought it was perfectly clear, from the paper which had just been read, that there must have been several successive changes of level in the lake referred to, and he should have been glad to have heard from the author, and also from Professor Wilson, what, in their opinion, is its probable antiquity. The alteration in the levels would account for the changes spoken of by the author. Lord Lovaine had suggested that the changes of level had been brought about by the growth of peat impeding the ancient outlet of the lake. Now, if the archæologist could determine a proximate date to the lowest of these dwellings, and to the ornaments that were found there, it would throw light on one of the most interesting questions in chronology. It would throw light on the rate of the growth of peat, one of the modes of measuring the chronology of what geologists considered very modern periods—modern, that is, in reference to the existence of man; for those lake dwellings, as far as we knew, all of them relate to a period when the form of Europe was just what it is now, or what it was when the Romans conquered Gaul. Contrasted, therefore, with the period of certain animals found in particular formations, these lake habitations were all modern affairs; and if the bronze period could be carried back, as Professor Wilson had remarked, to ages far more remote than had previously been thought, those lake dwellings which exclusively belonged to the stone period, but which also strictly belonged to the period of the living groups, and were long posterior to the time of the extinct animals, must be proportionately ancient, contrasted with historical times. He saw a letter the other day from an able Swiss writer, in which it was stated that not less than one hundred and sixty lake dwellings had been found on the lakes of Switzerland. A large proportion of these lakes had been examined, and it was perfectly clear that some of them belonged to the stone period, without the slightest admixture of bronze. Not far from one of these stone period dwellings there might occur one in which there were, perhaps, two thousand instruments, all of bronze, with hardly a mixture of stone. This was a most important fact in connection with the investigation of tumuli, inasmuch as it was said, with great propriety, that the stone may have been employed sometimes by those who could not afford anything better, while those who were more wealthy used weapons of bronze. It was also said that there must have been a gradual passage from one

to the other. But if in some of those lake dwellings—which were geologically recent—there were found some instruments of stone, and in others, at no great distance, instruments of metal, it was perfectly clear that there was no danger of confounding the two—that there was a long period during which the stone implements prevailed, and another in which bronze or metal prevailed, and that in some cases there appeared to be a gradual change in the art of making those instruments. If, therefore, the bronze period could be carried much further than the antiquaries generally supposed, how ancient must those villages be where there was nothing but instruments of stone. And yet both epochs belonged to a period in which there was not found one of those extinct animals of which geologists had found so many unequivocal remains. He might take that opportunity of saying that however convinced he was that there had been a great number of frauds practised, especially in the valley of the Somme, owing to the great demand for specimens, yet he was also perfectly convinced that ninety-nine—certainly more than ninety—out of every hundred which had been submitted to examination were genuine. His faith in the antiquity of the instruments referred to was not shaken by any of the impositions which had come to light. The fraudulent specimens were invariably covered by a matrix, on the removal of which all the signs of age and of use by man were wanting. They wanted the discoloration of surface, and the original black fringe, and the incrustations of crystallised carbonate of lime, which characterised the genuine instruments. They had also other marks of their pretended character, which are easily distinguished. It had been observed in reference to the flints of Abbeville that if the workpeople there could impose on so many English and French scientific men, how could we know that we had not been imposed on before! First of all he would say that there was an essential difference in the character of the heads, but he would also remark upon a piece of evidence on which every person could judge as well as scientific men. Was it possible, that after we had gone on for nearly twenty years finding flints of the ancient type so rarely that only two or three would turn up at Abbeville during the course of a winter's digging—was it possible, or at least likely, that all at once, in three different places several miles apart, and in gravel of a different character, an epidemic, so to speak, should break out of just the particular types that were wanted? That was a consideration which ought to have prevented many persons from believing in the authenticity of all the specimens that had turned up. Referring again to the peat growth question, he might remark that it appeared from an island in a lake, in the county of Cavan, Ireland, that the lake had acquired additional depth in consequence of the growth of peat stopping the outlet. He could not help hoping, therefore, that we should by degrees get such a measure of the possible growth of peat under such situations as would serve, to a certain extent, to help us in speculating on the minimum of time which a growth of thirty feet of peat may have required. He still hoped that, upon examination, there would be found not merely ornaments but implements, and the remains of domestic and wild animals of the

period. If the lakes of this island were searched with anything like the diligence which was shown in Switzerland, we should doubtless discover a great deal of most important information on the subject of these newly-discovered habitations.

On certain Markings on the Horns of Megaceros Hibernicus. By Professor BEETE JUKES, F.R.S. (C.) Two large portions of bone, found at a depth of forty feet in a peat bog near Longford, were indented near the middle with depressions, arising, in the author's opinion, from pressure exerted from above while they lay at right angles, one upon the other.

Dr. FALCONER said that he had arrived at a diametrically opposite conclusion. Bones of reindeer, cut in precisely a similar manner, had been found in various bone-caves, the *rationale* of the markings being that the strong extensor tendon had been removed by sawing it away from the bone, just as the Esquimaux do at the present day. The "cross-hatching" marks, often to be seen on such mammalian bones, were undoubtedly produced by human weapons. Natural pressure would not have removed the strong outer layer of the bone, and preserved the weak, cancellated interior.

Professors Rupert Jones, Tyndall, and Wyville Thomson concurred with Dr. Falconer, as to the artificial character of the indented cuts—Sir W. Armstrong and Mr. Sorby taking the opposite side of the question.

*Notes on Sir C. Lyell's "Antiquity of Man."** By Mr. JOHN CRAWFURD.

Sir R. MURCHISON said that he had no doubt that the paper which had just been read would create a great deal of discussion. On one point, at least, the author had succeeded in showing that Sir Charles Lyell had made a little slip in the recent work which had been published by him—namely, in attributing to all languages no greater antiquity than a thousand years. Upon the whole, he congratulated Mr. Crawfurd upon the manner in which he had treated the subject; and being an unbeliever himself in the doctrine of the transmutation of species, he cordially approved of the general tenor of the paper.

The Rev. Dr. HINCKS said that he differed so entirely from the author of the paper, that he would not have it supposed that if he did not say anything against some portions of the paper, they were to conclude that he agreed with them. The paper was in fact a complete *omnium gatherum* on every conceivable subject, and it was wasting the time of the section to discuss such a paper. The part he should especially speak on was where he could see very clearly that Mr. Crawfurd had written the most entire nonsense. He pretended to criticise Max Müller, but it was clear that he did not in the least understand what Müller's theory was. He thought it a great pity that Mr. Crawfurd should meddle with such subjects, because it was very evident that he was quite ignorant of the science of language.

* This paper was read before the Ethnological Society in April last. See *Anthropological Review*, p. 60.

After dwelling on matters of detail, and exposing what he thought to be the fallacy of Mr. Crawfurd's assertions and reasoning, he concluded by urging the importance of having a separate section, in which there really could be scientific discussion, especially for questions connected with the science of language.

The Rev. JAMES BRODIE, of Monimail, said, that after having carefully examined Sir Charles Lyell's work on the Antiquity of Man, he had come to the conclusion that he (Sir Charles) had utterly failed to prove that man had existed more than four thousand five hundred years. If there had been time and opportunity he would willingly have stated his reason for coming to that conclusion. As to the origin of variety in the human species, it was very evident, when the mental and bodily characteristics of man were taken into account, that there was but one species. It was very difficult to determine how and when the different varieties came to be formed from the parent stock. The Egyptian mummies and the pictures upon ancient temples proved that distinct races had existed for a great length of time without physical alteration.

Sir GEO. DENNIS said that, like the previous speaker, he also had carefully read Sir Charles Lyell's work, but so far from differing, he cordially agreed with the conclusions at which that learned author had arrived.

The Rev. J. D. GEDEN, of Manchester, said that the whole structure of the Indo-European languages, throughout their geographical area, was substantially the same. The syllables were constructed on the same principle, and the words were subject to the same laws of accident and derivation.

Sir WALTER JAMES said, that while he admired the ability and skill displayed by Mr. Crawfurd in the preparation of his essay, he totally differed from him on some important points. Mr. Crawfurd's hypothesis assumed that the first man, or the first set of men, must have been savages—a theory quite inconsistent with the notion that man was created by a Supreme Being. Arguing *à priori*, the first man created by the Supreme Being could not have been imperfect of his kind, but must have been endowed with strong intellectual and physical powers.

Dr. DONKIN said that Sir John Herschel had clearly shown that where a man was reduced to a point little above the ape in point of intelligence he was physically the most imperfect creature on the face of the globe.

Professor WILSON said that an essential distinction between man and the lower animals lay in the fact that man was what might be called a naturally domesticated animal, whereas the natural state of the lower animals was wild and untamed. Take the wild ox from the plains of India, house and feed him, and give him an artificial existence, and very soon there would be discernible differences of constitution and form distinctly traceable to the new mode of life. In one respect the one would be improved; that is to say, he would be better fitted for the purposes for which man required him, but the animal would, in point of fact, be degraded from his natural position.

But if man were taken from a wild and savage state and domesticated and civilised, everything that was truly noble in him and natural in him would be improved and developed. This proved that man was totally distinct in his primary condition from the lower animals, and that in his first state he must have been—not a half-bred savage, but a thinking, intellectual, noble being. The question of the development of varieties in the human race was one the solution of which would be slow and laborious, and he sincerely hoped that scientific men would not jump to rash conclusions. It was premature to bring forward the ethnological question of the unity of the human race as one capable of receiving a distinct answer. Much light must be thrown on the relations of languages and other subjects before science could solve the problem. In the meantime scientific men must be content to wait and to work backwards from point to point in their investigations—from known to unknown languages and races. One illustration in point could be easily produced, and it was a very valuable one, as showing the development of a new variety of men. When the Anglo-Saxon passed over to the continent of America with the Pilgrim Fathers they were distinguished by all the characteristics of Englishmen. Two hundred years had passed away, and what with the influence of climate, food, and perhaps the admixture of Indian blood, the American race had grown out of the old stock. One could hardly see an American in the street without knowing him to be such. It was important that those who rashly challenged the doctrine of Sir Charles Lyell as to the antiquity of man should bear this fact in mind, for if two hundred years had been sufficient to develope a New Englander, one could easily imagine that the thousands upon thousands of years Sir Charles was prepared to assign to man's past existence were sufficient to change either a white man into a negro or a negro into a white man.

Mr. Crawfurd, in reply, stated that the exceptional instances of new breeds quoted by Mr. Brodie from the animal kingdom proved nothing in relation to the varieties of the human race. He could point to equally remarkable cases in the human family. Many years ago he met in Burmah a man covered all over with hair, and having no teeth. This man married a fair woman and had two children, one of whom, a boy, was fair, and the other, a girl, was, like her father, covered all over with hair and had no teeth. When the girl grew up, some friends of his were anxious that she should marry, and accordingly they offered a large premium to any one who would take her for a wife. At length a man was found who was sufficiently courageous to do so. Two children were born of the marriage, and again one was fair and the other exactly the counterpart of its mother. But such exceptional facts could not account for the immense varieties in the human species. As to the Americans being a distinct race, there were probably a dozen or more American gentlemen in the room, and he defied Professor Wilson to point them out.

Sir Roderick Murchison congratulated Mr. Crawfurd on having elicited so interesting a discussion. As a geologist, he was impressed with that portion of Sir C. Lyell's work which had reference to the weapons used by the aborigines of France and England. The

character of the formation in which they were found proved clearly that they must have been deposited there ages before the period usually assigned for the creation of man. The application which Professor Wilson had made of that fact was a very important one, for if ethnologists had so much longer a period in which to carry on their researches, they might find means to account for the great changes that have taken place in some portions of the human family.

The Antiquity of Man. By Professor PHILLIPS (C.)—He said that one of the remarkable fruits of Geological investigation was to invest almost every point on the earth's surface with a new interest. The small French village of St. Acheul had long been remarkable for the school of the Jesuits established there; but antiquaries had discovered that it was near a burial ground of great antiquity. In the course of excavation there were discovered the graves of people far more ancient than any known to have been buried there. Other memorials were also discovered; and on one he had obtained from the workmen he read the name of Constantius. A stone coffin was found, and also an armlet, which had been placed on the arm of a buried person. When they looked in front of the great face of excavation, and saw overhead the Jesuit College, the ancient cemetery, and the Roman and Pre-Roman graves, the question arose, "What could be the antiquity of the sand and gravel deposit at the lower level?" In Sir Charles Lyell's recently published volume the situation was fully described. Concerning the deposits, there was no difference of opinion; they were to be reckoned among the later deposits of the geological time, and in the lower parts of these deposits a great number of interesting implements had been obtained, and some of these he exhibited. He described the deposits in detail, from illustrations, stating that fresh water and land shells were found in sand and scattered flints in an argillaceous deposit over it. For the fresh water and land shells in the gravel it was not necessary to appeal to the action of the seas, which, however, was seen in the lower part of the level. There were, in different levels, cases of great agitation of water, comparative agitation, and comparative tranquillity. They might imagine a lacustrine deposit, against which there would be the objection that it would not produce gravel in such a form, it being twisted about in all ways. There ought to have been found lying parallel to the surface of the lake a great number of lacustrine shells; but that was not the case, and the explanation would not apply to the mixture of fresh water and land and amphibious shells. The more ordinary explanation was to suppose the action of a river which had changed its position, so that the flint

instruments found near the bottom might formerly have existed near the top. The arrangement of the sands was obviously of such a kind that they floated over the pebbles, and covered all below. The whole question came finally to this:—Could they determine the age of the gravel beds? They could not escape the conviction that the flint instruments were of the same age as the gravel beds. Upon the supposition of strata having been deposited by river action, the upper surface of the deposits would continually tend to become level, and would be so when the deposits were of an argillaceous nature. In this case the slope varied from $2\frac{1}{2}$ to $1\frac{1}{3}$ degrees. In order to account for the present condition of things, it would be necessary to suppose that the country had been disturbed, and that there had been an elevation affecting the valley of the Somme. On an examination of the locality they would speedily arrive at the impression that it was requisite to remember that there was no period of geological history from which it was safe to exclude a movement of the earth's crust. The map of France showed the causes of the elevation. The rivers ran in parallel lines across the chalk, and it was impossible to separate the circumstance from the similar fact in this country, where these phenomena had been discovered. As there was reason to think that the valley had been subject to upheaval, accepting the supposition, they would not be able to determine the question of age by the excavation of the river. If they followed the suggestion of Sir C. Lyell, and took their measure from Scandinavia, they might come to some determination as to time; but this was a case of a local disturbance of the earth's crust, affecting certain lines of country in a given direction, and apparently ceasing beyond that. As it would be to some purpose to ascertain the antiquity of these deposits, he trusted Sir C. Lyell would not think it otherwise than a compliment to hear an opinion differing from his own.

Mr. Warington Smyth said that it was only during the last few years that this series had engaged attention In the main facts, as they might be taken by the public, geologists were pretty well agreed; but, nevertheless, the results to be deduced were so momentous in regard to the history of man, that they must be obliged to gentlemen who devoted not only days, but even years, to the elaboration of the details. Professor Phillips differed in no great degree as to his facts from Sir C. Lyell; but as to the explanation of these phenomena and the physical agencies by which they had been produced there were differences of opinion, some attributing the present position of these curious strata to the erosive action of water, and some to elevations which we knew from other sources the whole of these countries had been subjected to within a recent period.

On the Alluvial Accumulation in the Valley of the Somme and Ouse. By Mr. R. A. C. GODWIN-AUSTEN, F.R.S.—The object of this paper was to show that these two river valleys belonged to areas over which the geological changes had differed so greatly that, at present, comparisons could not be made; that the materials of the gravel-beds of the Ouse had, like those of all the rivers of the east of England, been derived from the "boulder formation;" and that the state of the animal remains indicated that they belonged to the fauna of the period antecedent to the boulder clay; consequently that, should it be proved that flint implements were to be met with in the Bedford gravel-beds, it would not prove that the *Elephas primigenius* and its associates were contemporaneous with man. The valley of the Somme was shown to belong to an area which lay beyond the "boulder formation"—that the series of alluvial beds differed greatly in respect of the physical conditions under which they had originated, yet that they indicated a definite order of succession, and implied a vast lapse of past time; in each of these flint implements have been said to have been found. The only evidence on this point which the author considers to be reliable is that with respect to the Champ de Mars, near Abbeville, where the beds belonged to the most recent portion of the alluvial series of the Somme, in the "subaërial" accumulations. The author further attempted to show that there is no sufficient evidence of a post-glacial elephantine period; and also that the Somme valley could never have been the line of drainage of a vast river, but that the phenomena of river alluvia at great elevations are to be accounted for by physical changes of definite date.

Sir C. LYELL said he had expected to hear Professor Phillips and Mr. Godwin-Austen express a wider divergence from his own conclusions than they had done. He took it for granted that Professor Phillips agreed with him in the important point that not only the flint implements which he mentioned in the case of St. Acheul were of the same age as the old river gravel, but also the extinct mammalia. It therefore appeared that they agreed in the important point of the coexistence of man with those extinct animals. The new view which he had attempted to explain was that the upper valley gravel, some eighty or one hundred feet above the level of the sea, was not now in the position it was when the river flowed there, and formed this extensive deposit of sand and gravel. If he understood the argument, there was such a slope of the gravel covered with loam towards the Somme as there would not be if it was the deposit of a considerable river in its original state; in that case the slope would be the other way, from the river towards the bluffs, as in the case of the Rhine and the Mississippi. He was not prepared to say whether it was possible to calculate on the identity of the present state of that surface

with what it was at the very remote period when it was formed, and since which it must have had so many washes by rain during many thousand years. He was not prepared to say whether they could reason in that manner as a change of position. What he said was, that there was nothing in his speculations on the river gravels hostile to the conclusions which Professor Phillips had proposed of there having been possible local movements, or, at any rate, a considerable movement of that country since the old river flowed. He thought it was almost impossible that that should not be the case. Indeed, when he found two levels of river gravel, one higher and the other lower, it generally appeared to him that that must be in consequence of some great movement, that there must have been probably some stationary period, when great accumulations took place; and that there must have been a period of movement, the waters eroding and cutting away the country, until they settled down at a lower level, and there was a formation of gravel there. This was a most propable thing; but they must bear in mind that though they talked of these appearances at two different levels, there were occasionally intermediate levels and deposits of gravel even higher than St. Acheul. It would be difficult to suppose that it was always strictly at two levels that these gravel beds occurred; but there was a prevalence of them at a higher level and at a lower level, that lower level being necessarily higher than that of the present Somme. He, therefore, had no objection to suppose that, after the country had been for some time in that state at which the gravels and sand were formed, there was some movement or elevation during which the river was able to cut the land down, and then form the inferior or lower level gravels; and it did not appear to him that if that view were adopted it made any very essential difference. Professor Phillips thought it made this difference—that the time would be much shorter if there were such a movement, and certainly it would; but he could hardly conceive any movement would enable the river to destroy so much older strata, as it must have destroyed to produce such reiterated river beds. If Professor Phillips could bring evidence of such a movement it would be a great assistance; but that would not alter at all any views which Mr. Prestwich and himself had arrived at with regard to the manner in which the higher and the lower levels were formed. There were other proofs besides the fresh-water shells, and the absence of marine animals, of the fluviatile origin of the St. Acheul gravels. The gravel in the Somme, the Seine, and their tributaries was composed of rock that belonged to the hydrographical beds of those rivers. In addition, there was the presence of fluviatile shells as well as of land animals. He could receive the views of Mr. Prestwich that these gravels were remains of an old river; and he could admit that there might have been such a movement as Professor Phillips had supposed. Mr. Austen, in speaking of the Bedford section, had endeavoured to do away with the argument in favour of the antiquity of man, by supposing that the remains of extinct lions, rhinoceroses, and other animals, taken out of the gravel, which was about thirty feet above the level of the sea, were derived from an

older gravel. He supposed some preexisting formation, out of which the bones were taken, and then deposited in the present, so that that formation which contained the flint instruments would not be proof of the co-existence of man with those extinct mammalia, and that the mammalia existed before, and were washed out into the beds containing the flint instruments. Such an objection might be made to almost every river bed, because rivers were constantly ploughing up their channels, doing and undoing. Therefore, if any animal remains had sunk in the channel, the chances were that they would be torn out again, and rolled on before they got to their final resting place. It was perfectly true that in some of our valleys, such as the Severn, the old drift containing distinct animals will be undermined, and occasionally bones in a state of integrity will be thrown down into the new river bed. There were such cases, and they were guarded with respect to them; but as a general rule, if they found remains buried in gravel, the inference was they were formed during that long period when that ancient growth was deposited, bed after bed, and sometimes partly destroyed and re-deposited. If a geologist wished to draw a contrary conclusion, he was bound to show, first of all, where was the old formations out of which these extinct bones were derived. To make out his theory he would be bound to show that such a formation was under the drift of that country; which, however, was not the case. Under the circumstances, the hypothesis seemed a violent one, formed to get rid of a violent conclusion, to suppose that these bones had been derived from some other formation that existed in the neighbourhood, without a shadow of evidence of there having been such a one, and with all the existing evidence against it. He hoped the conclusion was one which, on reconsideration, Mr. Austen would not continue to maintain.

The Rev. S. W. King gave an interesting description of a section of the Norwich crag exposed by a recent fall of rock, and said he thought the name of the rock was too local.

Dr. Falconer could not accept the views of Mr. Godwin-Austen as to the mammalian remains in the implement-bearing gravels having been derived, like the inorganic materials, from a pre-existing age. No two mammalian faunas could be more unlike than those of the pre- and post-glacial ages. The Miocene Tertiary was marked by an exuberance of pachydermatous animals, and an excessively small development of ruminantia. Then, after a lapse of time so great that 1700 feet of strata had been formed in Europe, the Miocene mastodon dies out, giving place to two elephants and some colossal forms of deer; but still there was a marked absence of bovine animals. Immediately after the glacial submergence, new conditions of the surface set in, river-terraces and valley-gravels were accumulated from the pre-glacial material, but the organic contents of these were not those of the older beaches. All their characteristic types were wanting; instead of *Rhinoceros Etruscus*, *Elephas meridionalis*, and the larger deer, we had *Bos priscus* and *primigenius*, the musk ox, and the reindeer, and these bones often in a perfectly fresh condition—not rubbed, and scratched, and polished by ice-friction, as were the relics of the older time. So fresh and complete were these mam-

malian bones, that from a gravel at Folkestone, in exact parallelism with those of the Somme valley and of the valley of the Ouse at Bedford, he had obtained an entire fore-limb of *Hippopotamus*.

ETHNOLOGY.

Varieties of Man in the Malay Archipelago. By Mr. Alfred Wallace, F.R.G.S. In the Malay Archipelago are found two very strongly contrasted races—the Malays, and the Papuans. The former inhabit the great western Islands, Sumatra, Java, Borneo, and Celebes; the latter New Guinea and the adjacent small islands. The typical Malays are of a light brown colour resembling cinnamon or lightly roasted coffee, they have constantly straight black and rather coarse hair, little or no beard, and generally smooth hairless bodies, they are of a low stature, rather strongly made, with short thick feet and small delicate hands. The face is broad, the eyebrows flat, the nose small, well formed, with the nostrils somewhat exposed; the lips broad and well cut, the mouth large but not projecting. In character the Malay is impassive, reserved, and bashful. His feelings of surprise, admiration, or fear are not readily manifested, and he has little appreciation of the sublime or beautiful. He is somewhat taciturn, is deliberate when he speaks; he but seldom laughs, nor does he openly express his gratitude for a favour. He revenges an insult more quickly than an injury. He is honest and trustworthy in many matters, but prides himself upon his capacity of lying. His intellect is but mediocre, he is deficient in the energy necessary to acquire knowledge, and his mind seems incapable of following out any more than the simplest combinations. He is quick in acquiring mechanical arts, and therefore makes a good servant for simple routine duties. The Papuan is, in many respects, the opposite of the Malay. In colour he is a deep sooty brown or black, his hair is very peculiar, being harsh, dry, and frizzly, growing in little tufts, which in youth are short and compact, but which in adults often grow out so as to form a compact frizzly mop, nearly a yard in diameter. He is bearded, and his arms, legs, and breast are more or less hairy. The Papuan is taller than the Malay, and, perhaps, equal to the average of Europeans; the face is elongate, and the hands and feet rather large; the forehead is flat, the brows very prominent, the nose large, long and arched, with the nostrils hidden by the overhanging top. The face has thus a Semitic character, which is perceptible even in the children. The moral characteristics of the Papuan separate him widely from the Malay. He is impulsive and demonstrative in speech and action. His emotions and passions are expressed in shouts and laughter, in

yells and frantic leapings. He is noisy and boisterous in speech and action, both at home and before strangers. Of his intellect less is known, but it seems at least equal, and probably superior, to that of the Malay. He has a love of art, decorating his canoe, his house, and almost every domestic article with elaborate carving. It must be granted, therefore, that these two races are most strongly contrasted, and if mankind can be classed at all in distinct varieties, the Malay and the Papuan must certainly be kept separate. Besides these well-marked races are the inhabitants of the intermediate islands of the Moluccas and Timor, which, though differing in some degree from both, may yet, in almost every case, be classed with one or the other of them. The Negritos of the Philippines, and the Semangs of Malacca, differ in most important characters from the Papuan races with which they have hitherto been classed, and must be considered to have Asiatic rather than Polynesian affinities. The recent evidence of the antiquity of man, and his having survived geological changes and the extinction of many species of mammalia, introduces a new element into ethnographical researches, and enables us to speculate more freely on the application and origin of races. Mr. Darwin's researches on the structure and origin of the coral reefs of the Pacific, render it highly probable that great islands, or even continents, have recently sunk beneath its waters. The present distribution of animals in the Pacific Islands leads us to conclude that this subsidence is geologically recent. The inhabitants of all the Pacific islands as far west as New Guinea and Australia, have much in common, while they differ greatly from other races. Combining these facts and boldly following their indications, we may divide the Malay Archipelago by a virtual waving line through the Moluccas, so that all the tribes to the west of the line will be Malayan and of Asiatic origin, and all to the east Papuan or of Polynesian origin. This division is in harmony with that which has been shown to exist in the animal productions of the same regions, and obviates the difficulties attending every theory hitherto proposed as to the affinities and derivation of the Malayan and Polynesian races."

Professor JUKES said he could quite confirm Mr. Wallace's statements as to the distinction between the Malay and the Papuan races. He differed from him, however, in identifying the frizzled hair of the latter with that of the Negro. He was much struck with the latter part of the paper. The author had arrived at conclusions with reference to the antiquity of man, which he (Prof. Jukes) had ventured to draw some twenty years ago, though he had not ventured to state them publicly otherwise than in magazine articles and other anonymous papers. It had been for twenty years impressed upon his mind

that the great depression of land in Oceania was one of the chief causes operating for the distribution of race. If there had been a large continent in that part of the world inhabited by man, which continent has sunk and disappeared, and the tombs of which now exist in the coral islands, then the antiquity of the inhabitants of those islands would have to be dated from very far back indeed. In private discussions among his friends twenty years ago he never attributed to the human race an existence of less than a hundred thousand years. He had no data for arriving at that opinion, but the impression had been produced on his mind, and he still entertained the same conviction. A hundred thousand years was, after all, a small period to allow for the depression of a vast continent and the springing of a number of coral islands out of the bed of the ocean.

Dr. JAMES HUNT said that the paper which had just been read was one of the most important that had been submitted to the notice of the British Association. In the last portion of it the author very properly stated that the modern discovery of the vast antiquity of man had opened up fresh ground, and had, in fact, put the whole science of man in a new light. Some four years ago he had the honour of reading a paper before the Association on the harmony of the evidence in support of the antiquity of man, and on that occasion he spoke of the inadequacy of any of the views which had then been publicly put forward. The fact was, that when we talked of the existence of the human race we got out of our depth, and there were no data on which to build our conclusions. When he read the paper to which he alluded before the Association he quoted a remark from a German work which produced a smile, and which would probably have a similar effect now. The remark was to the effect that man had existed for not less than 35,000 years, and that there was every reason to believe that he had existed for nine millions of years. With reference to the question of race, the author of the paper very properly attached great importance to the principles of art which were found in different races. He entirely agreed with that sentiment. He would ask the author, however, whether he thought that similarity of language was a test of affinity, and whether, in the absence of civilisation, he did not admit that in certain races there was an inability to accept civilisation? Mr. Wallace ascribed the changes that had taken place in the races of Europe and America to physical causes. He would ask whether there was not a mental influence also at work in producing these changes?

After a few remarks from Mr. Crawfurd,

Mr. WALLACE said that the questions which Dr. Hunt had put to him were exceedingly difficult ones. With regard to language, he thought it was inferior as a test of race to physical and moral characters, but it was a very good test of close affinities of races which had been recently separated. It did not appear to him that it could be said of any race of men that it was unable to accept civilization. The inhabitants of Great Britain were once savages, and the Romans might have said of them that they were incapable of receiving civilisation, with as much justice as we could say so of the Negro. As-

suming the correctness of the hypothesis of the remote antiquity of man, it might be argued that if one people—the Britons—could exist 50,000 years uncivilized, why could not another race exist 52,000 years without losing their capacity for improvement. With regard to the influence of mind on the changes of race, there were no doubt many varied causes to be taken into account, and he was not prepared to say that any particular influence had not been at work.

Sir J. RICHARDSON said that the very first problem in reference to the antiquity of man had not yet been solved. As yet we could not venture to state what was the precise age of a bank of peat moss. The paper which had been read seemed to him to strengthen the theory of the unity of the human race. If ethnologists had only time to work out the changes in the human family some very serious difficulties would be removed.

Ethnology of Eastern Mantchuria. By Captain FLEMING. The particulars in this paper will be found in the recent work of this author.

On the Ethnology of Ceylon, referring especially to its Singalese and Tamil inhabitants. By MUTU COOMARA SWAMY. The author commenced by saying that the population of Ceylon was nearly three millions, and that its inhabitants, who were distributed among a great variety of races, might be classified under the heads of European, Asiatic, and Eurasian. The population was not great, and consisted chiefly of English, Irish, and Scotch emigrants, employed in the civil and military service, or on the plantations. The Asiatics of Ceylon are the Veddahs, the Singalese, the Tamils, the Moors, and the Malays. The Veddahs are hunters, and are supposed to be the aborigines of the island. The Tamils of Ceylon belong to the same race as the Tamils of Southern India, and consist either of those who have been on the island for centuries, or who are recent emigrants. They are to be chiefly found in the north-east portion of the island, and their two great capitals are Jaffna and Trincomalee. Their main occupation is agricultural. The coolies are the labourers of the island. They cross over in large numbers from the continent during the coffee season. The Singalese are the inhabitants proper of Ceylon, and range themselves under the heads of Kandians, Low Country Singalese, and Rhodiahs. The Kandians are the inhabitants of the hill country, and are a hardy robust race, never till recently intermingling with their low country brethren. Their language is made up of three component parts—Elu, a Singalese pure, the Pali, and the Sanscrit. They possess an extensive literature, and their religion is Buddism. The low country Singalese are either Bhuddists, Roman Catholics, or Protestants. The influence of Roman Catholicism is very great, and

the people are divided into classes after their occupations. The Malay population of the island is small, and the inhabitants form the Ceylon Rifle Regiment. They are faithful soldiers, brave and obedient; and in their religion thorough Mahommedans. The Moors are the small traders and shopkeepers of the island.

Mr. Elliott said that the Tamil nation was the type one of the two great nations of Southern India, those who spoke the language of the south, and those who spoke the language of the north. Each was totally distinct from the other; the northern dialect being derived from the Sanscrit and the south being Tamil, and having a distinct alphabet of its own. He thought it probable that the slave population had also spoken a distinct language, as there were words still used by them which were not easily recognisable in the Tamil. These were probably vestiges of a tongue which was lost in the extreme state of destitution to which the race was reduced.

Mr. Crawfurd expressed his gratification that the population of Ceylon had increased so much within the last twenty years. He had not the least doubt, however, that the island could easily support ten millions of inhabitants, and that it would ultimately reach that number if the Government continued to be wisely and liberally administered. He believed that all the pearls used by ladies in this country were Singalese pearls, being distinguishable from the Persian by their peculiar whiteness. The Malays of Ceylon were a very useful and industrious race.

Dr. Hincks, having made some allusions to the peculiarities of the religion of some portions of the Asiatic population of the island, Mutu Coomara Swamy entered into some further particulars respecting the distinctions observable between the philosophical religion of the Hindoos and Bhuddism. The former taught the doctrine of the absorption of the soul into the Deity and of four degrees of happiness—the existence of the soul in the same sphere as God—its still closer affinity—its assumption of the form of God, and finally its absorption into the Deity. Three-fourths of the religion of the Hindoos was philosophical, and he claimed for his countrymen that they had worked out metaphysical problems of the same nature as those of Kant and other German philosophers, long before Kant's philosophy was thought of in Europe. It was, however, a failing in his philosophical countrymen that they often found themselves in cloudland, and went so far in their religious speculations as sometimes to doubt even their own existence. In this respect they showed the same fate as other metaphysicians who were apt to lose themselves in the labyrinth of their own subtleties.

Ethnology of the Island of Formosa. By Mr. Consul Swinhoe. This paper was read before the Ethnological Society in the beginning of the year.

On the Origin of the Gypsies. By John Crawfurd, Esq. This paper was read before the Ethnological Society last session. Mr.

Crawfurd says:—"The origin, as our old English has it, of the 'outlandish persons calling themselves Egyptians or Gypsies,' and constituting 'a strange kind of commonwealth among themselves of wandering imposters and jugglers,' is, at least, a subject of great curiosity, not to say of etymological import. Although their first appearance in Europe be coeval with the century which witnessed the discovery of the New World and the new passage to the Indies, no one thought of ascribing to them a Hindu origin, and this hypothesis, the truth of which I now propose to examine, is but of very recent date. Their Hindu origin was not for a long time even suspected; it has of late years, however, received general credence, and, I think, justly. The arguments for it consist in the physical form of the people, in their language, and in the history of their migration. The evidence yielded by physical form will certainly not prove the gypsies to be of Hindu origin. The Hindus are all more or less black; and assuredly no nation or tribe of Hindus now exists, or is even known to have ever existed, as fair as the gypsies of Europe. It is on language chiefly that we must rely for evidence of the Hindu origin of the gypsies, and even this is neither very full nor satisfactory. The dialects spoken by the different tribes of this people, although agreeing in several words, differ very materially from each other. Besides the genuine Indian words to be found in the language of the gypsies, they all contain a large intermixture of foreign tongues, consisting of words of the languages of the people they dwell or have dwelt amongst,—of Persian, of Arabic, of Turkish, of Greek, of Hungarian, and of various Sclavonian tongues; these being, in some cases,—as, for example, in the Persian,—more numerous than the Hindu words. This is what was to be looked for from four hundred years' residence in Europe, and their sojourn among oriental nations in their necessarily slow journey westward. The Indian words which exist in the language of the gypsies are by no means so numerous as the Latin ones which are found in the Welsh and Armorican, or in the Irish and Gaelic, and there will be found wanting in the Gypsy language classes of words which are indispensable towards proving it of Indian parentage. Of the migration of the Gypsies from India there is assuredly no record in Indian history, neither have we of their arrival in any Asiatic country before they reached Europe. In both France and Italy their first appearance was in an inland city, in both of which they began at once to tell fortunes; a fact which supposes, of course, some acquaintance with the language of the people whose fortunes they pretended to predict. From these two facts, it may be inferred that the Gypsies

were in France and Italy for some time before their appearance in Paris and Bologna. Most probably they came to Italy from Wallachia, through Servia, Bosnia, and Dalmatia, crossing the Adriatic; but what internal commotion led to their adventure is unknown. From Italy, where they were seen five years before they reached France, they probably found their way into the latter country. If the Gypsies were originally an Indian people (and there is no other evidence of their having been so than a few words of an Indian language), they were most probably captives, carried off by some western invader with the hope of peopling his own desert lands. I must come to the conclusion that the Gypsies, when above four centuries ago they first appeared in Western Europe, were already composed of a mixture of many different races, and that the present Gypsies are still more mongrel. In the Asiatic portion of their lineage there is probably a small infusion of Hindu blood; but this, I think, is the utmost that can be predicted of their Indian pedigree. Strictly speaking, they are not more Hindus in lineage than they are Persians, Turks, Wallachians, or Europeans; for they are a mixture of all of these, and in that in proportions impossible to be ascertained."

The Celtic languages in reference to the question of race. By Mr. JOHN CRAWFURD. There exist two living European languages which, going under the name of Celtic, are usually believed to be one tongue, or at least, sister languages of one origin, and spoken by the same race of men. These are, on one hand, the native language of Ireland and of the mountainous part of Scotland, which are beyond doubt essentially the same, and the native language of Wales and Brittany —which are equally sister tongues. I have long been of opinion that the two languages in question are really different and distinct tongues. The words which seem to me most distinctly to prove languages to be cognate are prepositions, auxiliary verbs and conjunctions, adverbs of time and place, those parts of speech, in fact, which form the link of language, and without which sentences cannot be constructed. When these are essentially the same in any two languages, these languages may be pronounced at once as sister tongues, while, when they differ, they may with equal confidence be pronounced as different tongues, or of different origin, although they may contain words in common. Tried by the test which I have endeavoured to describe, the Gaelic and Welsh languages will be found to be, not sister tongues derived from the same parent, as are Italian and French, but two distinct languages. Their particles and auxiliaries are wholly different. The

phonetic character of the two languages differs very materially, and, with the exception of a comparatively small number, their words are wholly different. I have compared, with all the care I could command, the Irish Dictionary of O'Reilly, with the Welsh of Spurrel. The first contains better than 50,000 words, and the last above 33,000; and, in this multitude, I could discover not more than 200 which were common to the two languages. In nearly every case of these there was a difference in the form of the words in the two languages, and this independent of the factitious difference arising from disagreement in their orthographic systems. If the facts and arguments adduced in the course of this paper are admitted, we must come to the conclusion that the Gaelic of Ireland and Scotland, with the dialect of the Isle of Man, on one hand, are the same language, while the Welsh and Breton, with the now extinct Cornish, are essentially the same on the other, the two classes of languages being essentially separate and distinct. So far, then, as language can be considered a test of race, and to the extent that one European race of man differs from another, the parties speaking the two languages must be viewed as distinct original races. The difference between the two peoples in intellectual endowment may not be appreciable, any more than it is in other European races; but, physically, I think it is admitted that the Welsh are shorter in stature and darker in complexion than the people at least of the western part of Ireland, where there has been the least admixture of foreign blood.

On Celtic Languages in reference to the question of Race. By Richard Stephen Charnock, F.S.A., F.R.G.S., F.A.S.L. At a late meeting of the Ethnological Society of London, John Crawfurd, Esq., F.R.S., read a paper on the "So-called Celtic Languages in reference to the question of Race"; which paper has since been printed by the author. The paper is so badly arranged, that it would be impossible to criticise it as a whole; I therefore propose to deal with it paragraph by paragraph.

The design of the essay is to show that the Gaelic and Welsh are two distinct languages, and are not derived from a common stock. "I have long been of opinion", says Mr. Crawfurd, "that the two languages in question are really different and distinct tongues; and having made such inquiries as were in my power, with the view of determining the question, I propose to state the result in the present paper. The qualifications which I bring to this task are soon told. One of the two languages, the Gaelic, was the language of my childhood (I still retain some colloquial acquaintance with it); and of the

languages of some oriental nations, probably in as advanced a state when their tongues took their present shape as were the Welsh and Irish when theirs did so." This sentence is not wholly undecipherable; but it might have been a little clearer. "In order to determine the consanguinity of languages, the first thing necessary is to find a test by which consanguinity can be certainly ascertained." The following is the author's test. "When between two or more languages there is a substantial agreement in phonetic character, in grammatical structure, and in the great body of their words, such languages may confidently be pronounced to be cognate tongues, or languages having a common parentage." No doubt; but are we to understand that it cannot also be the case unless all these circumstances intervene? In the very next sentence Mr. Crawfurd seems to contradict himself; or, at all events, to lay down a very different proposition. He says, "the words which seem to me most distinctly to prove languages to be cognate are prepositions, auxiliary verbs, and conjunctions, adverbs of time and place—those parts of speech, in fact, which form the links of language, and without which sentences cannot be constructed. When these are essentially the same in any two languages, these languages may be pronounced at once as sister tongues; while, when they differ, they may with equal confidence be pronounced as different tongues, or of different origin, although they may contain many words in common." We are told that the languages of Southern Europe all contain a considerable admixture of Teutonic words, but that they are written easily in words derived from Latin without their assistance, while it is impossible to construct a single sentence of them with words purely Teutonic. When our author speaks of the languages of Southern Europe, I take it he refers to the Italian, Spanish, Portuguese, and Romance languages. If so, after a careful comparison of these languages with the Teutonic, I am inclined to think that Mr. Crawfurd has made use of the word *considerable* for *inconsiderable*. "The proportion of Norman-French in our vocabulary is usually reckoned at one-sixth part, or five-sixths of our language is of German origin, although in use, from the nature of the words of the latter, the proportion is much greater." Whence did Mr. Crawfurd obtain this information? If he means to apply it to what is now called English, he must have consulted some old work on the language. In the first instance, the author of the paper is wrong in making use of the term German. But I will not quibble with words, as doubtless Anglo-Saxon is intended. It is necessary to notice this, because not only is there a great difference between these two lan-

guages, but the Anglo-Saxon (at all events, in proportion to the words that it possesses) contains a much larger number of words of Latin origin than do the German languages. I am aware that Hickes maintained that nine-tenths of the English dictionary was of Saxon origin, because there were only three words of Latin origin in the Lord's Prayer; that Sharon Turner was of opinion that the relation of Norman to Saxon was as four to six; and that another writer, who estimates the whole number of English words at 38,000, assigns 23,000 to a Saxon, and 15,000 to a classical source. Thommerel was of opinion that of 43,566 words, 20,853 were of classical, 13,230 of Teutonic (Anglo-Saxon?) origin, and that the remainder were from miscellaneous sources. None of these statements, however, will hold water at the present day. Out of the 80,000 words which now make up our language, considerably more than 30,000 may be traced to the Latin and Greek. As for the Norman element, instead of its constituting, as Mr. Crawfurd states, one-sixth part of the English language, it probably does not constitute one-fiftieth part. After descanting at some length on the Welsh and Gaelic, in order to prove that they are distinct languages, the author of the paper arrives at the question of grammatical structure. "I come next to the question of grammatical structure as a test of the affinity, so much relied upon of late by learned Germans. It is by this they come to the startling conclusion, that the leading languages of ancient and modern Europe have all sprung out of a dead language of India, or yet more extravagantly, from a language of the highest table-land of Central Asia, of which the very name and locality are pure myths. The corollary follows that all the races speaking them—black, brown, and fair, the Celts included—are of Eastern origin;" but, as we have shown elsewhere, it is not a corollary at all. In order to illustrate what is said in the previous passages, with regard to the European languages, Mr. Crawfurd very unreasonably refers to the American languages (1,200 in number), which he says have a common grammatical structure—one which distinguishes them from all the other languages of the world. He says, "that this, adopting the German test of affinity, ought to prove that all the American languages had one common origin, but that the theory is at once demolished by the crushing fact that, with the exception of the languages of a few neighbouring tribes and nations which have borrowed a small number of words from each other, the vocabularies of the numerous languages in question are wholly different; and that an agreement in grammatical structure is, therefore, in this case, no evidence of language; nor does

it even go to prove affinity of race." Is not this something like a *petitio principii?* Must we, as a matter of course, assume that because the vocabularies of two languages are wholly different, that, therefore, such languages cannot have been derived from the same stock? It is not difficult to conceive that a language may lose many of its words, or that words may be replaced by other words; and that, nevertheless, the grammatical structure of the language may remain the same. Missionaries asserted that in the middle of the eighteenth century the American tribe called the Araucaños spoke hardly a word which was not Spanish, though they preserved both the grammar and syntax of their own native speech.* Mr. Crawfurd says, "From the eastern borders of Bengal, to the utmost limits of China, the numerous languages spoken are, without an exception, monosyllabic, or their words consist of single syllables—which necessarily admit neither of inflection nor composition. They are, therefore, unavoidably of the same grammatical structure. But the words of these languages are wholly different, even when the race of man is the same; and of the races of man there are at least two clearly distinct ones, the Chinese being an example of one, and the Birmese and Siamese of the other." This sentence is rather foggy, but what is meant is, first, that in the tract of country referred to there are two distinct races; secondly, that although the structure of all the languages spoken in such tract is the same, the words are wholly different, not only when the race is different, but when it is even the same. In answer to this, I will simply ask, does Mr. Crawfurd mean to assert that the Siamese, or as it is more correctly called the language of Thaï, is a monosyllabic language. If the author of the paper had taken the trouble to look into the matter he would have found that the Siamese is not a monosyllabic language; and, further, that one of the two languages spoken in Birma is a polysyllabic language.†

I may here remark, that race can never to a certainty be determined by language. People of the same race may speak two different languages, while on the other hand people of different races may speak the same language, or at all events languages derived from the same source. The French and Italians are of a different race, although both nations speak a language of the same origin, *i.e.*

* Cf. Herves, Catalogo, t. i, p. 16-23; Max Müller, Lectures on Language, London, 1862, p. 77.

† The languages spoken by the people north of Birma, Siam, Cambodia, and China, are all polysyllabic; whilst in Japan, at the extreme east of the Chinese empire, of the two languages spoken, the *Koyo* is monosyllabic, whilst the *Yomi* is polysyllabic.

derived from the Latin. What would be thought of a man, who, having over night given what he considered cogent reasons for not visiting Rome during the summer months, on account of the malaria, should the next morning start direct for the Holy city; or of another, who, convinced of the inutility of fomentations for gout, should forthwith set to work to bathe his great toe in cold water? But the author of the paper does something like this. After going to the trouble of adducing arguments to prove, *as he thinks*, "that the boasted test of an agreement in the mere structural form of language is inadmissible as evidence of affinity;" and having travelled to the Malayan and Philippine Archipelagos and the islands of the Pacific Ocean, to disprove the structural theory advocated by Max Müller and others, Mr. Crawfurd proceeds nevertheless to compare the Gaelic and Welsh, with the view of showing that in point of structure they are entirely different languages. Again, after informing us that the formation of compound words, by the help of prepositions and postpositions, has been stated to be a distinguishing characteristic of all the languages called Indo-Germanic, or Aryan; and among these, as a derivative of the Sanskrit, the Gaelic, and Welsh, the author of the paper has the assurance to tell us "that no such manner of compounding words is known to either of these languages; and, therefore, in so far as this character is concerned, they are not of the pretended class in question." This assertion is wholly inexcusable, for, if Mr. Crawfurd, who "still retains some colloquial acquaintance with the Gaelic," had only examined the dictionaries of the two languages in question for the space of twenty minutes, he would have found that in more than one-third of the words in these languages the first syllable is a prefix. Perhaps, indeed, there is no language in which we have such decisive evidence of the formation of words by prefixes as the Welsh. The principal prefixes in the Welsh are *ad*, *am*, *an*, *ar*, *cyd*, *dad*, *dar*, *de*, and *dy*; *di*, *go*, *gor*, *hy*, *rhag*, *rhy*, *tra*, *try*, and *ym*. The prefix *ad* or *at* is of the same force and signification as *re* in "regenerate," "return;" thus, from *ad* and *galw*, to call, we get *adalw*, to recall. *Am* is both a preposition in the ordinary sense of that word, and a prefix. In composition it answers to the Latin *circum*, and the Greek περι, αμφι; thus from *am* and *chwyl*, a revolution, is *amchwyl*, a circumvolution. *An* or *a* (which, before *l* and *r*, takes the form of *av*,) is used in a privative sense, like the Greek αν or α, and corresponds with the Latin *in*, and the English *in* and *un*; thus from *an* and *mâd*, good, is *anvad*, bad. *Ar*, as a preposition, signifies close to or upon; hence from *ar* and *mor*, the sea,

we get *Amor-ica;* from *ar* and *coel,* a belief, *argoel,* an omen, a sign. The preposition *cyd* (var. *gyd, gyda*) is = the Greek *συν,* the Latin *cum.* As a prefix, it varies according to the letter which immediately follows; and is found as *cy, cyd, cyt, cyf, cyv, cym, cyn,* and *cys.* Thus from *cyd* and *gradd,* grade, station, degree, is *cydradd,* of the same rank; from *cyd* and *tir,* land *cyttir,* land held in common; from *cyd* and *mer,** water, sea, *cymmer,* a confluence of waters; from *cyd* and *dala,* to hold, *cynnhal,* to hold together, support, maintain; from *cyd* and *stâd,* state, *cystadl,* commonly pronounced *cystal,* of the same state. *Dar, de,* and *dy* are used very arbitrarily, and their power cannot be well ascertained; thus from *dar* and *eb,* a saying, is *dareb,* a proverb. *Di* is a privative, = the Latin *de* in *dedecus;* thus from *di* and *fydd,* faith, is *difydd,* faithless. *Go* is cognate with the Saxon *ge;* thus from *go* and *ber,* water, we have *gover,* a small stream. *Gor* is an intensive prefix (although it sometimes serves as a diminutive); thus from *gor* and *gwag,* empty, is *gorwag,* very empty. *Hy* answers to the English termination *able,* or the Latin *osus;* thus from *hy* and *cóv,* memory, is *hygov,* memorable. *Rhag* is both a preposition and a prefix of extensive use; thus from *rhag* and *dant,* a tooth, is *rhagddant,* a fore tooth. *Rhy* is an inseparable prefix, which adds intensity and activity to the root; thus from *rhy* and *taer,* bold, is *rhydaer,* too bold, presumptuous. *Tra* is used as a preposition and a prefix, and corresponds with the Latin *trans.* It has also another meaning, corresponding in power with the English *very,* and in form and power with the French *très;* thus from *tra* and *noeth,* night, is *trannoeth,* beyond this night, next morning. *Try* is also used in the same manner as *rhy;* thus from *try* and *llaw,* a hand, is *trylaw,* very handy, dexterous. Lastly, *ym* makes the verbs and verbals to which it is prefixed reflective; thus from *ym, ad,* and *nabod,* is *ymadnabod,* to know oneself.† Mr. Crawfurd considers the glossarial test in a comparison of languages the most complete and satisfactory. Having compared the Irish dictionary of O'Reilly with the Welsh dictionary of Spurrell, he tells us that the first contains more than 50,000 words, and the latter above 33,000, and that he has not been able to discover more than two hundred words common to the two languages. I will not venture to say whether the last part of this sentence is or is not correct; but when a philologist is desirous of comparing one language with another, one would think it would be the most reasonable to consult two dictionaries in which a comparison

* In some words, as will hereafter be seen, the two first syllables are prefixes.
† Cf. Archdeacon Williams's Gomer.

could be made. Now, O'Reilly's is the most voluminous dictionary of the Irish language; whereas Spurrell's is little more than a pocket dictionary; and, if Pughe's Welsh dictionary had been consulted, the number of words would have been found to exceed 95,000. Again, "taking the Welsh vocabulary, the Gaelic words in it will not exceed one word in one hundred and sixty-six. The English language, it is needless to insist, contains an incomparably larger proportion of Latin words, directly or indirectly introduced; the French, Italian, and Spanish languages a much greater proportion of Teutonic words. Even the Spanish at least has many Arabic words. But we know historically the real origin of all these languages—know the English to be of Germanic origin, the languages of the South of Europe to be derived from the Latin; while the other elements of all of them are extrinsic." This is partly erroneous, and partly puerile. The English is not of German origin, but a language, which, if every word be taken into account, is principally based upon Greek and Latin, derived partly through Saxon and Norman French, and partly direct from the two former languages. Mr. Crawfurd says, "With respect to the class of words common to the Gaelic and Welsh, they seem to me to be such as we can readily believe would gain admission into the languages of neighbouring people; and the probability is, that they proceeded from the language of the more advanced and powerful, to that of the least advanced and weakest. Such infusions are well known to have taken place among rude nations in other parts of the world, where intercourse was far more difficult, and the two British islands cannot be supposed to be an exception. The words common to the two indigenous British tongues are of a very miscellaneous character, but they are never such as are indispensable to the structure of language, while both tongues can be written or spoken without their assistance." Mr. Crawfurd then refers to the names of plants and animals, indigenous or of foreign origin, immemorially acclimated or domesticated, with the object of showing that they are generally different in the Gaelic and Welsh. Some stress is laid upon the fact that the Gaelic possesses no specific name for the bull or the entire horse. Mr. Crawfurd does not inform us whether the practice of gelding was common, or even known, to the Celtic nations. The Romans, no doubt, gelded their horses, at least those which they employed for common and domestic purposes. The nations of Africa and Asia, except the Chinese, never geld their horses at all; and some kingdoms of Europe have not yet adopted this barbarous practice. The custom in question belonged more peculiarly to the Scythians and Sarmatians,

than to any other nations; and the Franks first learned the art and custom from the Hungarians, and to this day the French call a gelding "cheval hongre." Mr. Crawfurd says, "the existence of Latin words in any Gaelic writings handed down by tradition, I may take this opportunity of stating, would prove them to be more or less adulterated, if they pretended to an antiquity beyond the era of the introduction of Christianity. Applying this rule to the poems of Ossian, whether those translated or paraphrased by McPherson, or such as have been handed down by oral tradition without his name, we discover words of Latin origin, which, had they been of the ages of Ossian, whose heroes are always represented as heathens, would not have been the case. We find, for example, such words as shield, sword, arms, gold, and silver, of Latin origin; but, above all, the names of the numerals from an unit up to a thousand, a class of words here of a compass not likely to exist in the language of a people so rude as must have been the Irish and Caledonians of the time ascribed to Ossian. That the poems of Ossian are spurious is one thing. There cannot be much doubt about the matter; but that the Latin words in these poems may have found their way into the Gaelic languages prior to the introduction of Christianity, does not seem at all unreasonable, and may be accounted for without any great difficulty. Let us see what our author says on the etymology of local names." He derives Armorica from two words common to the Gaelic and Welsh languages: viz., from *ard*, a height or high, and *muir*, the sea; or more probably, *mor*, great or extensive." But, taking into consideration the peninsular character of this part of France, the common etymology from *ar-mor*, "upon the sea," would seem to be the most reasonable. In like manner, Muirar, the native name of the province of Moray, in Scotland, is doubtless an inverse, from the Gaelic *muir-ar;* whilst Pomerania in Prussia has been very reasonably derived from the Slavonic *po-mor*, "upon the sea." We are told that "the etymology of the word Wales, which the French write Galles, is unknown, unless it be a corruption of the Roman word Galli." It is clear enough that *Wales* and *Galles* are the same word. The Anglo-Saxon has *Walas*, the Welsh, Britons; *Walli*, Britannia; *wealh* (pl. *wealhas*), a foreigner, stranger, one from another country, a Welshman, Welsh. The old German has *Gal, Gall, Wall, Wale, Weale, Walah*, a stranger, a Gaul, a Roman; *Walcholant*, Gaul; the modern German, *Welscher*, an Italian; *Welschland*, Italy. The Med. Latin *Wallus, Gualus, Gaul;* all which words are, without doubt, derived, with the aid of the prefixes *g* and *w*, from the old German *al, el*, strange, foreign; from

the Latin *alius*. Hence the Alamanni, who gave their name to Allemagne, *i.e.*, Germany, were called. There was also a Gaulish tribe called the Allobroges, who would seem to have derived the first part of their name from the same source.*

Mr. Crawfurd says "of the etymology of the word Britannia, employed by the Romans, there is certainly no certain knowledge. Some have derived it from the Prydain of the Welsh or the Bhreatunn of the Irish, but I think it far more likely that both these words are corruptions of the Latin word Britannia." This is not at all probable. The word Britannia, in Latin, means nothing at all; and is merely the latinized form of the original name of the country. The etymologies of the name Britain are legion; but perhaps the most reasonable is that from *bret inn*, "high island." Mr. Crawfurd is of opinion that the appellations of all great countries have been bestowed by strangers more civilized than their own inhabitants, and that the names of Italy, Spain, and Germany are examples in Europe; and India and China in Asia, to say nothing of the great geographical divisions, Europe, Asia, Africa, America, and Australia. Perhaps the author of the paper is right, although he has not proved it by *all* the examples which he has given. Further, whatever may be the European designation, it will be found to have been formed in many instances from a native word. Mr. Crawfurd concludes, "If the facts and arguments adduced in the course of this paper are valid, the languages which are its subject are two distinct and separate tongues. Bede, indeed, seven centuries ago, pronounced the Welsh and Irish to be as different from each other as Latin and Saxon. So far, then, as language can be considered a test of race, and to the extent that one European race of man differs from another, the parties speaking the two languages must be viewed as distinct original races." It remains to be seen whether by the facts and arguments which have been adduced, Mr. Crawfurd has proved his case.

To conclude: notwithstanding that a large amount of matter has been brought together in a small space, I am disposed to think that Mr. Crawfurd's paper is illogical and inconclusive; and that it is totally unworthy of the author of the very able dissertation on the Malay language.

* Allobroges, pop. Galliæ Narbonesis, sic dictus, quod ex alio agro translatus esset. Vetus Scholiastes ad Sat. 8, Juvenalis: *Allobrogæ Galli sunt. Ideo autem dicti* ALLOBROGÆ, *quoniam* BROGA *Galli agrum dicunt,* ALLA *autem aliud. Dicti igitur, quia ex alio loco fuerant translati.* WACHTER.

ADDENDUM.

Personal Recriminations in Section D. The following discussion, though having no reference to the subject matter of the paper, took place in Section D, after Mr. Carter Blake's paper on "Syndactyly in Man and Apes" had been read.

Professor ROLLESTON said he really had no remarks to make upon the paper which had just been read; but there was one thing that he would wish to lay before the Section, in order that they might see that the Sub-Section of Zoology had not been idle. When he heard that a paper was going to be read upon the hands and feet of apes, it struck him that Section D was not wanting in its duty; and a statement having been made, and having received—from causes which he would not specify—a large amount of circulation, it occurred to him that this paper might have some reference to the difference which that statement alluded to between the foot of the anthropoid ape and the foot of man. He thought that the propositions laid down by a gentleman in whom Newcastle had not realized the proverb that a prophet had no honour in his own country, might be going to be controverted; and under these circumstances, Dr. Embleton, another Northumbrian, and himself had thought it their duty to facilitate the proceedings of this Section by bringing forward the arguments and authorities that could bear upon the subject. They did not consider that the question was one to be settled by rhetoric, and so they set to work, and, as the result of four hours labour, they had prepared a comparison of the foot and hand of the ape with the foot and hand of the human subject. His business for six months in the year was demonstrator of anatomy; and he should be glad if any one who took an interest in the question would call upon him in Subsection D, to act as a demonstrator of anatomy upon this subject, and he had no doubt of being able to remove any doubts that might exist upon it.

The PRESIDENT thought their thanks were due to the President and members of the Sub-Section for their visit, and also for the valuable papers which that department had contributed to the Association. He should be glad, and he had no doubt it would give great satisfaction to all who were present, if Professor Rolleston would at once make the statement to which he had alluded.

Professor ROLLESTON said, if he thought that what he had to say was worth very much, he should not have acceded to that request, because, though not a Newcastle man, he was quite north countryman enough to know that there was nothing like standing by old friends; and, therefore, when he had had anything good to communicate, he had always taken it to Sub-Section D. A statement appearing in a journal of large circulation and popularity must have weight in the proceedings of an assembly like the British Association, which itself possessed popular elements; and every now and then, in such periodicals, statements did find place that astonished men of science, and misled persons who had no claim to that title. A statement of this kind, to which he wished now to refer, asserted that every naturalist

knew that the muscle that bound the great toe was, in the ape, also a flexor or bender of the other toes; whereas, in the human foot, it was a single muscle, the effect of which was illustrated in the pirouette of the dancer. So far from every anatomist knowing this to be the case, every anatomist could contradict it. There was no single work, ancient or modern, upon anatomy, which could give authority for such a statement. Henle, one of the best of the old authorities, so far from saying that the great toe of a human being had only one flexor, represented the muscle as sending out its branches to two other toes also. And every competent anatomist would deny the opinion which the writer of the article in question attributed to them all. There were several in that room who would confirm his words—who, with him, had taken the trouble to examine the question; and they would be happy to show to any one the results at which they had arrived. His fellow-countryman Mr. Church, who had written one of the best papers upon the muscles, was in the room, and no doubt his word would be taken; but, if it would not, no one would question the authority of Dr. Embleton, who was also present and ready to confirm what he (Professor Rolleston) stated. A broad and sweeping statement was made, and the world was informed, *ex cathedra*, in a periodical of great circulation, that every anatomist was acquainted with the fact mentioned. He appealed to those gentlemen whom he had named, and also to Mr. Turner and Dr. Cleland, to say whether the statement was correct.

Mr. TURNER could confirm in every respect what Dr. Rolleston had said. There did exist in the human foot a connection between the flexor muscle of the great toe and the other toes, and that connection was the rule and not the exception.

Dr. JAMES HUNT wished to ask Professor Rolleston whether he had any objection to name the "journal of large circulation" in which the statement occurred. If that were done, they would then be in a better position to discuss the matter.

Professor ROLLESTON scarcely thought that the gentleman who put the question could be ignorant of the name of the journal, but would state at once that it was the *Edinburgh Review*.

Mr. BLAKE, in order that the question might be adequately considered, would suggest that the *Edinburgh Review* of April last should be placed upon the table, and the passage in question read at full length. He thought the references in the way in which it had been mentioned, to an article published in accordance with all literary ethics, were calculated much to complicate the subject by the introduction of personal and irrelevant controversy. The customs which usually governed these literary publications prevented the avowal or the disavowal of the review in question; but he might request that the whole of the passage might be read, and further, that certain of the passages in the same publication upon analogous subjects might be read also.

Dr. E. PERCEVAL WRIGHT wished to say a word, in confirmation of the statements of Dr. Rolleston and Dr. Turner. During the last two winters he had taken every opportunity of examining this point,

and in no one instance was he fortunate enough to discover a single exception to what he was inclined to believe was the normal anatomy of this muscle. He had likewise talked over this subject with his friend Professor Hyrtl, of Vienna, whose opportunities for prosecuting the study of human anatomy were immense. and the exceptions to the ordinary state of things found by him were very rare indeed, so that it would appear that the author of the statement in the review in question had mistaken some popular statement for a scientific though easily acquired fact.

Dr. CLELAND could also confirm, so far as his knowledge went, the statement of Professor Rolleston.

Mr. BLAKE said he should be glad to have the statement shown to him in the article in question, in which *simpliciter* it was declared that the insertion of this muscle in the great toe was unaccompanied by any further diversion of it. All that was there stated was, that the force concentrated upon the great toe.

Mr. CHURCH thought that an allusion had been made to his paper. He might be excused for making an observation. It was stated in the review, in reference to this muscle, that in the foot of the various wild nations, and particularly in climbers of trees, it showed more deflection generally. He had tried to find out the differences which the muscles in the human form showed, and though he had had the advantage of the Bodleian and the Radcliffe libraries, he had been unable to find any anatomical account of the wild races of man, in reference to the foot: and he should be glad to know where such accounts were to be found.

Professor ROLLESTON might perhaps be allowed to hint that the discussion had gone quite far enough. The article contained the words, this "solitary tendon passes along the sole of the foot," &c., and after stating the position it occupied with regard to the great toe, proceeded to compare it with that in the foot of the orang-outang which possessed three tendons, so that there could be no question as to the construction which the words bore. On a question of this kind authorities were better than rhetoric, assertions, or opinions, and to authorities he had therefore confined himself.

Mr. BLAKE believed the words "solitary tendon" as the reviewer had used them were strictly correct. By the assertion that one solitary tendon passed along the sole of the foot he was not aware that by any logical construction was conveyed a denial of the fact that before the muscle sent forth its greatest slips, other divergent slips may not be sent forth, and in no passage had the presence of those divergent slips which Mr. Church and Mr. Turner had pointed out been denied. He must complain that such unfair stress should be laid upon the passage, that its meaning should be thus warped, that the logical signification of the words should be, he hoped unintentionally, misrepresented, and that dust should be thus thrown in the eyes of zoologists, as had been done in the theatre of Albemarle Street. He was certain that his anatomical brethren would give the writer of the passage in question credit for having offered a fair and true explanation of the broad differences between the foot of the ape

and the foot of a human being, and the best explanation he could have given to a general audience. The broad question was left just as it was—the whole force of the long flexor in the man was concentrated upon the great toe; but a different condition prevailed in the apes, the force of the long flexor being in their case divided amongst several toes. He was unprepared for a discussion of the myology of apes arising upon a question of their integument, and the subject seemed to have travelled far beyond the record.

The PRESIDENT (Professor Balfour) observed that the question had reference only to the tendon, and reading the passage in the review in the ordinary sense, they had a solitary tendon in the one case, contrasted with three tendons in the other, so that it seemed Professor Rolleston was justified in the construction he put upon the words.

Dr. EMBLETON said he had at one time entertained the belief that that which Mr. Blake had stated was the general rule; but on referring to old authorities as well as to the more recent works upon the subject, he found that the cases where there was a single tendon only attached to the long flexor were the exceptions only.

Dr. CLELAND said the dispute narrowed itself very much to this:—Mr. Blake found fault with the article being treated unfairly; but the force of the reviewer's arguments appeared to be that whereas in the monkey there were three tendons going to three different toes, in the human being the force was concentrated upon the great toe only. The fact was, that the tendon was connected not merely with the great toe, but with all the other toes also, and exercised its pressure upon one as well as upon the other, so that it could not logically be said that the force of the muscle was concentrated upon the great toe.

Professor ROLLESTON wished, before the discussion closed, to ask whether it was not the duty of the president of a section to call attention to such statements, bearing upon his department, as appeared in journals of scientific pretensions? He had thought it his duty, in the sub-section over which he presided, to draw the attention of those who attended the section to statements that were growing current in the periodical literature of the present day. He had taken pains to make himself master of such subjects as came before the section, and to acquaint himself with the popular as well as scientific literature in reference to them, and in that way he had referred to the article in the *Edinburgh Review*.

The PRESIDENT (Professor Balfour) considered that Professor Rolleston had done quite right in calling attention to this matter. It was a great advantage for subjects of this kind to be brought forward and discussed, and he had no doubt that Mr. Blake would agree with him in that opinion.

Mr. BLAKE admitted that Dr. Cleland had very well put the case, and if the word "concentration" was objected to, he would say the greatest power of the muscle was used on the great toe, or employ any analogous word; there was the greatest portion of the power directed upon the great toe in a human being, and there were also divergent slips the existence of which the reviewer did not deny, while, with respect to apes, the force was diverted to several toes. He could

only express his gratification at the way in which this discussion had been carried on by Dr. Cleland, Mr. Turner, Mr. Church, and Dr. Embleton, and expressed himself entirely in accordance with the anatomical facts, as well as the interpretation of the reviewers' version of these facts which these gentlemen had that day promulgated. He wished also to take that opportunity of expressing the very great pleasure he felt on reading the very able paper on the Chimpanzee by Dr. Embleton; and so long as they had scientific facts of this nature, met, as they always ought to be, in a fair spirit, unaccompanied by garbled versions of writers' statements, he should always consider himself proud to enter the lists with such learned anatomists as Dr. Embleton, Mr. Turner, Dr. Cleland, and Mr. Church.

Dr. DAVY did not see how the gentleman who had just spoken could with any justice assert that garbled versions had been brought before the section, seeing that the passages which Mr. Blake desired to be read were read both by the gentleman himself and by Professor Rolleston. He trusted, therefore, that the offensive expression would be withdrawn.

Mr. BLAKE would willingly withdraw the word, if it was offensive to the section, and say that the construction put upon the article by Professor Rolleston was certainly not that which the writer wished to convey.

Here for the present we must conclude our notice of the proceedings of the Association. We have not reported a paper read by Mr. Richard Lee, on the extinction of races, which is of the less importance, as no discussion took place on his paper, and we understand it will ere long be read before the Anthropological Society of London. We shall then be able to present it to our readers at our next issue. We shall speak of Captain Grant's paper, on noticing the forthcoming work by Messrs. Speke and Grant. We can find nothing in Mr. Craft's paper on "Dahomey" which is worth printing. The object of the paper seemed to be to throw discredit on the account which had been sent to this country by M. Jules Gérard; but it was evident that most of the revolting scenes described by that traveller were admitted to exist by Mr. Craft. He, however, denied that they were so revolting. It is very significant that M. Jules Gérard, in his letter to the Duke of Wellington, should have said so markedly, that he was sorry Captain Burton was not present to confirm what he asserted. Mr. Craft was present with M. Jules Gérard, and it is not a little ominous that this traveller never refers to Mr. Craft as a witness. We are sorry to hear that Sir Roderick Murchison at once accepted Mr. Craft's account as correct, and even went so far as to say that "M. Gérard had probably indulged a little in imagination from, the desire to render the description of his journey as graphic as possible."

We hope this assertion was made in the heat of debate, and not as intentionally throwing discredit on the veracity of M. Jules Gérard, who, being in a foreign country, was unable to reply to the attacks made against him in his absence. Let us have patience and hear both sides of the question, before we condemn a traveller, and a foreigner, in this wholesale manner. In the meantime we would suggest to Sir R. Murchison, and to anthropologists generally, whether they do not think that much of the difference in the accounts of the two witnesses may be explained by the two travellers having different "instincts"? Mr. Craft has a certain amount of African blood in his veins, and this must influence his innate ideas. We can, therefore, readily understand that scenes which would be very horrible to M. Jules Gérard, would not appear in such hideous colours to a Mulatto, like Mr. William Craft. While on the subject of half-breeds, we should mention some interesting episodes respecting Mr. Craft, who was put forward as a "pure Negro," and continually described and spoken of as a "fine specimen of his race." What race? we asked, but could get no reply. In the Journal of the Association he was described as "an African Gentleman." But Dr. Philip Carpenter objected to this, and in a letter to the President said, "Mr. Craft is not an African but an American gentleman, having been born in the Southern States of America." Mr. Craft then cleared up the confusion of ideas as to his race, by saying, "he considered himself an Englishman of African parentage, unfortunately born in America." But this is not quite satisfactory, as Mr. Craft knows kimself that one of his parents is a Euro-American, and the other he has never alleged to be of really pure African blood.

This episode well represents the confusion which exists respecting the terminology of anthropological science, and we hope that the promised Report of the Anthropological Society on this subject will soon be issued, that some of this confusion may be removed. We cannot conclude our report without expressing our thanks to the local newspapers of Newcastle for the admirable manner in which the sectional meetings were reprinted, especially in the *Newcastle Chronicle*.

It was not without regret that we looked in vain for the face of the man who has been the Chief Secretary of Section E for many years—we allude to Dr. Norton Shaw. We presume the President forgot to allude to the loss the Section had sustained in no longer having that intelligent, able, and courteous geographer to act as Secretary. We also noticed that the two other Secretaries who have acted with Dr. Shaw for some years past did not act this year.

Mr. C. R. Markham has taken Dr. Shaw's place, and Mr. Carter Blake the place of Dr. Hunt. Mr. Thomas Wright was prevented by other engagements from attending the meeting this year. Mr. Crawfurd was present, fighting his battles with all comers, as of old. We venture to say that there is no man who attends the meetings of the Association who has had more fighting than this venerable member, and there is evidently no one who so thoroughly enjoys asking his friends "to tread on the tail of his coat." His opinions on all ethnological subjects are just as they were forty years ago, at which time Mr. Crawfurd, to his lasting honour, was one of the first to raise his voice against the stereotyped popular ideas which then existed respecting man's past history. We trust he may long be spared to attend the Association, and we feel sure that none will more heartily join in this wish than those who are most opposed to his scientific teaching and his antiprogressive ideas. We can scarcely ask of a hard-headed Scotchman of eighty years of age that he shall advance with the times; but we hope, for his own reputation, that Mr. Crawfurd will not, in his maturer years, help to arrest the cause of scientific truth, of which he has been so brave a champion during the last fifty years. We heartily coincide with Mr. Crawfurd's remarks on proposing a vote of thanks to the President, when he said, "Nature evidently intended Sir Roderick Murchison to be a President. He combined in the most happy proportions firmness and amenity, and always made the meetings over which he presided pleasant and profitable."

Before we conclude our report, we feel it our duty to express our earnest desire that Section E may long be spared that painful exhibition of personal animus which has, during the last few years, been introduced into the discussions of Section D. It will, perhaps, hardly be believed when we state the fact that, on a paper being read by Mr. Carter Blake, in Section D, on "Syndactyly in Man and Apes," a member of the Association was allowed to get up and make a long tirade against the writer of some anonymous article in the *Edinburgh Review* of April last. Not a word of discussion took place on Mr. Blake's paper, but the time of the Section was taken up by listening to Dr. Rolleston's grievances against this anonymous writer. We were glad, however, to hear the severe castigation which Mr. Blake administered to him, and which will, we trust, make him more cautious not to attack again in debate one who is evidently so much his superior.

Section E was much indebted to Professor Daniel Wilson, of

Toronto, for many excellent speeches. We are glad also to be able to find a full and original report of the excellent speech on Archæology made by Mr. George Tate, the well-known antiquary and geologist, and active Secretary of the Berwickshire Naturalists' Field Club. To the character of the speeches generally we will quote the words of the esteemed President, who said, "I have been a member of the Association from its foundation, and I must say that I never presided on any occasion on which there have been such numerous audiences, and so many admirable discussions. I may add, that I have never presided on any occasion on which I have seen so much good feeling exhibited, not only by persons around me on this platform, but by all those who have taken part in the proceedings." These were Sir R. Murchison's parting words to the Section, and we must now close our report. The Association has sustained a very severe loss in being deprived of the valuable services of Professor Phillips, who has from the commencement of the Association been its most energetic and able manager. A universal feeling of regret is felt throughout the Association at his loss. We hope he may long live to enjoy his well-earned popularity, and that his example will be the means of inducing his successors to follow in his disinterested and impartial footsteps. We believe that universal satisfaction is felt at the selection of Sir Charles Lyell as President for the ensuing year. Anthropologists have especial reason to be satisfied, for no one has of late years done more for the progress of Anthropological science than Sir Charles Lyell. We were glad to see him in Section E this year, and hope that for the future we shall see him far oftener. Everything bids fair to make the next meeting at Bath successful. We trust that during the time that will elapse before the meeting, Anthropologists will bestir themselves to bring all their forces together, and thus help to secure the formal recognition of Anthropological science by the Association. We understand that notice has been given by Dr. Hunt, that Section E shall for the future be devoted to "Geography, Ethnology, and Anthropology." A general rumour prevailed that there was to be a sub-section especially devoted to Anthropology. We think, however, that an increase of the number of sections is objectionable, and we see no necessity for such a division. As an independent journal, devoted to Anthropological science, we shall feel it our duty to advocate a union of Anthropology with the present Geographical and Ethnological section.

WAITZ'S INTRODUCTION TO ANTHROPOLOGY.

ONLY a few months have elapsed since the Anthropological Society of London announced that they intended publishing a translation of the first volume of "Waitz's Anthropology of Primitive Peoples," and now, just as we go to press, the volume is issued to the Fellows. We shall only be able to give a short outline of the first impression which the work has made on us. In the first place, we must say that the rapid manner in which the book has been produced is most creditable to the Society, and especially to the editor, Mr. Collingwood. We hope this good example will be followed by other editors of works which are announced to be published by the Society. The Anthropological Society, if they had done nothing else, and should now cease their labours, would have effected very much for Anthropological science. Therefore, for the first time in the history of British scientific literature, we have a compendium of modern Anthropological science. It is almost enough to shame our national pride to think that such a work should not come from one of our own countrymen; and yet, with all the merits of this work, we still see that a German alone could have written it. Its very value for anthropological students consists in its defects. Many will take the book up and ask, "Is the author a Monogenist or a Polygenist?" But, we are glad to say, they will have to read the book before they will get their curiosity gratified. Nothing will help to do away more effectually with that shallow school of thought, which makes all science relating to man resolve itself into a solution of the problem of man's origin. This volume will help to put the science of Anthropology in a proper light before the scientific men of this country. It is a matter of amazement to find that the science of Anthropology is only just receiving a recognition from men of science. We may not agree entirely with the exact position which he assigns to Anthropology, but we cordially endorse his statement that "it is requisite to declare in this place, once for all, that Anthropology is to be considered as an empirical science, because its subject, *Man*, is only known to us empirically, and hence it is requisite to study man by the same method which is applied to the investigation of all other natural objects."

The author has traced the gradual rise of Anthropological science, and the different meanings which have been attached to Anthropology, and very properly limits the sphere of this science, and shows

that it has a positive existence as a science, and is not merely a collection of borrowed materials. Much, however, of the author's introduction will be too metaphysical for the English mind. The great fact remains, however, that the author divides Anthropology into four great objects; the first being Man considered from an anatomical and physiological standpoint; the second, in his psychological aspects; the third, in his social and historical aspects; and the fourth, treating man, under his ethnological aspect, as composed of races. The volume before us is divided into two parts; first, the physical, and, secondly, the psychological. The first part embraces a general introduction to the physical investigation, in which the signification of species is fully and clearly discussed. Then comes section the first of the physical investigation "on the mode and magnitude of the physical changes to which man is subject," occupying about seventy pages. Section two consists of a dissertation on "the chief anatomical and physiological differences which exist in the various races," with an Appendix "on the asserted inviability of the Americans, Polynesians, and Australians." Section three is on "the results of intermixture of different types and the peculiarities of mongrels." Section four consists of a "review of the principal theories regarding the unity of mankind." Section five treats of the "classification of mankind." Then comes the second part of the book, divided into three sections; first, the specific characters of man; secondly, the natural state of man; and thirdly, the various states of civilization, and the chief conditions of their development, followed by a general recapitulation. Such are the contents of this volume, which forms a complete introduction to the present state of Anthropological science. There are but few men living who are qualified to have undertaken such a vast inquiry. The author very modestly observes:—

"I had from the beginning no hope of arriving at a perfect solution of a question which it were desirable should be treated by the united powers of the zoologist and geologist, the linguist, historian, and psychologist. But as such a happy combination may be long in occurring, there remained but the alternative either to leave the question in abeyance, or to try its solution with insufficient means."

There is one thing which will render this book specially valuable to the English student, and that is the admirable manner in which Professor Waitz has quoted the authorities for his statements. He is not content with giving the name of the author, but the title of the work, the page on which the statement occurs, and the year in which it was published. These authorities are very voluminous, and evince

the labour which the author has bestowed upon his work. It must have been not only a labour of love, but the work of many years systematic reading, to accomplish such a task. We are sure that the rising generation of anthropologists will heartily thank the author for his labour, and the Anthropological Society for its boldness in undertaking the responsibility of producing such a work. Nor has the editing of this volume been a slight task, and as far as we are yet able to judge Mr. Collingwood has been most careful to render the work readable, and must have taken great pains with his work. The Index which he has added greatly increases the value of the volume. We shall speak of his introduction, and of the general manner in which he has accomplished his task at a later period, when we shall continue our notice of this volume. For the present we must content ourselves with making a few general remarks on the first sections of the book.

We are glad to see that the author has again called attention to the confusion which Prichard and others introduced into the science, by considering unity of descent and unity of species to be convertible terms. He says: "We shall therefore adopt the first proposition that unity of species results from proved unity of origin; but not the second, which has often by zoologists been considered as inseparable from it, namely, that separate descent, wherever it can be traced, is a sufficient proof of difference of species."

Waitz criticises, we think justly, Dr. Nott's statement, that "every animal, from man to the worm, is governed by special physiological laws." No doubt Blumenbach and others have carried their analogies between the laws regulating man and animals too far; but it is unphilosophical to assume that which has yet to be proved, that man is not governed by absolutely the same physiological laws. On the contrary, we are justified in assuming that the same laws regulate all organic life; and there is the best reason to suppose that there is but one great system of organic development, and that the physiology of animal life is the same in principle, but with an endless diversity in its application. Nott also says: "The rules current among breeders of domestic animals have been considered as applicable to man, but the notion itself is very unphilosophical, and could never have originated with any intelligent naturalist of thorough experience."

Here is a difficulty meriting the serious attention of anthropologists at the very threshold of their science. We shall be glad to see this subject taken up in a really fair and candid spirit. We are fully

conscious of the vast difficulty surrounding such an inquiry, because it would necessitate a series of experiments as to the influence of aliments and other physical agents on the different races of man, as well as on animals. It is not a little remarkable that the lamented and philosophical anatomist, Robert Knox, was also of Dr. Nott's opinion, and continually protested against the application of the laws regulating plants and animals to the physiology of man. We may, indeed, nearly surmise that it was from the writings of Knox that Nott received the idea. The subject is open to discussion, inasmuch as there are some curious facts and inconsistencies which have never yet been explained. The author very properly observes :—

"The investigation of the unity of mankind as a species can only be finally completed when the results of long continued influences of all possible external conditions in which man is able to live are as fully and clearly ascertained, as the results of all possible crossings of various human types after a long series of generations. But as our experience in this respect is very far from being perfect, we are compelled to stop at some more or less probable propositions, which must proceed from the solution of the question, whether a gradual alteration of types belonging to the same stock can be proved, and whether it be sufficiently extensive in order to show that the greatest differences prevailing among mankind are merely variations."

The whole spirit of the work seems to be due to the natural revulsion of feeling with which the author regards the statements which have recently been advanced in the most dogmatic manner respecting the proofs of the diversity of man's origin. The author takes the other side, more apparently to show the fallacy of such reasoners, than because he is opposed to their views. Dr. Waitz is avowedly an advocate for unity of species, if not of descent, and we shall therefore dwell more especially on some of the difficulties of which the author is himself conscious in reconciling known facts with the theory of unity of origin.

In the first place, he treats of the influence of climate on man, and the result is, that he can deduce no generalization which will meet all the presumed facts we have at hand. It might have been reasonably supposed that, after so many observations had been made, we should be enabled to make some generalization which would meet the facts; as, for instance, that the dwellers on mountains and hilly districts are lighter in complexion than those in the valleys. The author is induced to think that the evidence will support this theory; but admits that the facts are not free from contradiction, and says, "It is difficult to admit that the browning of the skin in our

climate in summer is produced by the same causes as the black colour of the Negro, and that it would only require a greater intensity and a longer duration to become so entirely." He equally objects, in the cases of dark spots, which occasionally occur in lying-in-women, that this diversity is attributable to the influence of diet; nor can he subscribe to Volney's theory of the influence of light and heat in producing the overhanging eyebrows, half closed eyelids, raised cheeks, and projecting jaws of the Negro. He also admits that it is proved that the diversity amongst mankind does not depend alone on geographical latitude and mean temperature. At page 41 he quotes a goodly list of instances to prove this. He then says, "the colour of the skin is not so much owing to climate as to descent" (p. 42). But this is just the very argument of the opposite school. Yet ten pages afterwards he says, "Colour, like many other physical peculiarities, depends partly on local conditions besides geographical latitude." And yet he can produce no local conditions by which he can explain these results. At p. 45 he gives several instances to show that the inhabitants of mountains are lighter in colour, and physically and intellectually superior to the inhabitants in the valleys. He points to the assertion frequently made, that it is heat combined with moisture which produces the dark skin; but Tschudi expressly says, the colder the climate the darker the colour. D'Orbigny also says that a hot and moist climate, with sufficient protection, is favourable to whiteness of the skin. The author quotes the case of the Portuguese settlers in the west coast of Africa being transformed into black mulattoes; but here is no influence of climate, but simply the result of intermixture. It would be well if future writers on this subject took a little more pains to inquire whether settlers of this sort took any women with them. He quotes Raffenel to show "that there are well authenticated instances of pure Arabs who had become darker than those accounted very dark among Negroes." Will Captain Burton kindly supply us with some of these instances?

The author quotes from Stanhope Smith as to the influence of climate on the Europeans in America, and notwithstanding the protest of Knox, Nott, Broca, Crawfurd, and others, we are bound to say all recent authorities have tended to confirm the fact that some influence changes the European in America. The personal observations on this subject of Desor, Pruner-Bey, and Berthold Seemann are most valuable and suggestive. The author says,—

"Beside, the leanness, the stiff shaggy hair are also characteristics of the American; the curly hair of the European becomes straight

in America (Jarrold), so that the American is, generally, in caricature, represented with a long neck and long hair. The latter is, in comparison with the soft silky hair of the Englishman, evidently an approach to the American Indian. The long neck is connected with a weaker development of the glandular system, to which must be added the nervous irritability of the American. These peculiarities have been connected with the dry west winds which predominate in the United States; notwithstanding nearly double the quantity of rain which falls there, in comparison with most European countries, drought frequently injures the harvest. Other causes contribute to this change, such as the restless activity of the Yankee, and his love of spirituous liquors. The American is also said to have a voice of less metal, and his eyelids are said to be shorter than those of the European."

In speaking of the inhabitants of the West India Islands, the author mentions the frequently noticed fact that the Negroes there in places of trust have European features, and instead of allowing, as is well known, that this is simply the result of intermixture with Europeans, he says, these facts "at least show that the bodily formation of the Negro has not that absolute permanence which some would ascribe to it; and though one might be inclined to confine their change of type within narrower limits than higher races, those who, like Nott, deny any change of the Negro in America, are evidently in the wrong."

Now, here we have a case in point, and Dr. Nott may feel that his position is perfectly tenable if no better instance can be brought against his teaching. Dr. Nott admits that the Negroes are improved in America from their intimate contact with a superior race. The author quotes Stanhope Smith's assertion, that "in New Jersey especially there are Negroes to be found with straight noses, well-formed foreheads, and straight incisors;" he continues: "These instances, although they may not be considered as *perfectly impartial observations*, are too numerous, too definite, and too free from any suspicion as to their sources, to be rejected off hand." We fear, however, that we must pronounce them either as most impartial observations, or else the result of ignorance on the subject. Nor can we agree with the author that these statements are "definite," for they appear to us to be of the vaguest nature, and totally unworthy of record in any scientific work.

The part of the work which treats of what the author calls the "spontaneous origin of new peculiarities," is of great interest as recording the opinions of different writers on the question of transmission of acquired mental and physical peculiarities. The author believes that, under favourable circumstances, some mental character-

istics are transmitted, and that this might contribute to an explanation of the differences existing in the physical organization of mankind. The whole of this part of the book is very speculative, and the author can find but few facts to support his theory. It is chiefly reasoning on analogy as to what is effected in the lower mammalia; but at the same time he contends we do not require the analogy, as we have the hereditary transmission of peculiarities in the human subject proved in very many cases. The conclusion to which the author arrives on the influence of physical agents is given in the following words:—

"The assertion that the physical type possessed by the respective races remains entirely permanent is erroneous; it is only as to the limits of certain changes that doubts exist. It is impossible to determine the exact influence of each individual agent, or to point out its limits. The theory which has most in its favour is, that mental culture possesses the greatest influence, climatic conditions alone have the least, diet and mode of life hold an intermediate place. Finally, the spontaneous origin and transmission of new qualities appear among the most influential agents in the production of differences among mankind."

The chapter "on the anatomical and physiological differences which distinguish the various races" is not so good as the first section. He says that the assertion of Messrs. Nott and Gliddon, that the Bushmen as nearly approach the orang-utan as they do the Europeans "are shameless exaggerations." After treating of the physical organization of the Negro, he concludes by saying, "it cannot be doubted that there is a certain resemblance between the Negro and the ape, although the distance between them is sufficiently great to discard any idea of their relationship." We confess ourselves not to be able to understand the meaning which the author attaches to the word "relationship." After dwelling on the physical characteristics of the Negro, a subject which we hope to hear fully and freely discussed at an early meeting of the Anthropological Society, he adds, "It cannot be our intention to deny by these remarks the greater resemblance of the Negro to the ape in comparison with the European, but simply to point out that the resemblance has been greatly exaggerated." We merely point to this chapter that the reader may see the opinions of the different authorities which the author has quoted on this subject.

Here, for the present, we must conclude our notice. We feel that we shall be rendering more service to the science of Anthropology by dwelling on the different parts of this work than by hur-

riedly passing over some important matter. Whatever faults we may have to find with the work, we feel sure that its publication marks an epoch in the study of Anthropology in this country. No longer will anthropologists be obliged to confess that they have no text-book for their science; but they can now say to the inquirer, "read and study Waitz's Introduction to Anthropology, as you will learn all that science yet has to reveal."

(*To be continued.*)

KINGSLEY'S WATER BABIES.*

In these days, when Anthropology seems to be reviving from the prolonged torpor in which it has placidly rested since the time of the publication of the sedative works of Prichard, while the great doctrine of the subordination of the actions of each individual, his birth, his life, and his death, to the operation of uniform dynamical laws which govern the entirety of external nature, is now receiving universal acceptance, the publication of the above work marks the period of an epoch in our biological literature.

Great changes in the thoughts of mankind have often been distinguished by the publication of poetical or satirical effusions. Since the time when Aristophanes satirized the nascent biological truths which were then scarce yet cropping out amongst the thoughts of Hellenic inquirers, and ignorantly confused them with Socratic speculations; since the time when the painters of the Egyptian papyri, often, in the exercise of their sportive skill, depicted the various known animals in ridiculous or ludicrous positions; since the time when the beetle-hunter and butterfly-preserver of Pope's *Dunciad* were regarded as beings beneath the notice of the poet or the reciter of "smart things;" down to the period when authors who profess to investigate the history of England sneer at the "most intense study of entomology" as something almost incompatible with the attainment of correct information, exalted ideas, or noble sentiments, great changes

* The Water Babies; a Fairy Tale for a Land Baby. By the Rev. Charles Kingsley, F.L.S., F.G.S., Honorary Fellow of the Anthropological Society of London, and Professor of Modern History in the University of Cambridge. 8vo. London and Cambridge: Macmillan. 1863.

have taken place in the world's thoughts. We have to deal at the present time with the advocates of the inductive method, with the disciples of a philosophy founded on the observance of the constancy of the laws of nature, and consonant with, if it may not be directing, the cause of the state of European science at the present time. To those who may wish to emulate the reputation of some of those quasi-scientific writers, who have no notion of any more lofty conception of the science of life than the inspection of a series of disconnected objects, each exhibiting "evidences of design," and nothing more, and who are characterized by the lines which have been applied or misapplied to the poet Göthe:—

> "The lessons he taught mankind were few,
> And none that could make them good or true,"

to those who regard the whole universe as subordinated to man, who creates the laws by which the inferior beings live or die; or to those who may, while they thoroughly comprehend the systematic and classificatory productions of zoology, be wholly ignorant of the great conclusions to which the conception of such system and classification leads us, Professor Kingsley's "Water Babies" will open a new vista of contemplation wholly at variance with the habitual and unrefreshing thoughts which may have left feeble impressions on their plastic minds.

The style of the work is throughout in pure English—such English as Kingsley always writes—clear, manly, and to the point. In this it may fairly bear comparison with any of Professor Kingsley's previous publications. The superficial reader will merely be struck with the flashes of wit and humour which are scattered throughout the book; the "land babies," for which it is ostensibly destined, must, however, attain a competent knowledge of biological controversy before they can hope to comprehend it, while the disciples of the false philosophies which it satirizes, will hardly relish the castigation administered. The description of such remedial agents as life-pills, homœopathy, mesmerism, pure bosh, the distilled liquor of addle eggs; "antipathy, or using the subject like a man and a brother; apathy, or doing nothing at all; with all other ipathies and opathies which Noodle has invented, and Foodle tried, since black fellows chipped flints at Abbeville, which is a considerable time ago, to judge by the Great Exhibition," should be carefully read and studied by those medical practitioners who may feel disposed to commence a heterodox practice. The pure anthropologist has, however, more interesting matter afforded him. That destructive

school of scientific thinkers who, like the giant in the great land of Hearsay, would smash in the temple of the land for the sake of three obscure species of Podurellæ and a Buddhist bat, the latter cognate with that which is said to be confined to the Buddhist temples of Little Thibet, meet with due notice in the work.

We regret that the exigencies of our space preclude us from the reproduction of the inimitable passage in which Professor Kingsley applies the Darwinian laws to the supposed "degradation" of the ape from the human species. The career of the Doasyoulike nation, whose neglect of the physical laws conditional on their existence reduced them ultimately to gorillas, is no doubt familiar to many of our readers, and upon the supposition, therefore, of their familiarity with the work, we feel bound to point out that the great flaw in the Darwinian theory, which Professor Kingsley, to a certain extent, we believe, advocates, is admirably illustrated in this passage. According to our interpretation, when the Doasyoulikes had once ascended the trees, and the weaker individuals had been all eaten up by the lions, the felines would have had nothing to eat. They would consequently have been hungry, and unless their structure was modified to catch something else—and Professor Kingsley telling us of no other carnivorous or herbivorous animal, upon which to prey—they must, in the long run, have died of inanition. Then, when the lions were all dead, the Doasyoulikes might have safely descended the trees, and the further transmutation of the scansorial man into the ape would have been rendered functionally unnecessary.

Or, we are as much at liberty to suppose plasticity in the organization of the lion as of the man. The organization of the lion being slightly plastic, those individuals with the most powerful claws, and in whom the scapular arch was most mobile, let the difference be ever so small, would be slightly favoured, and would tend to live longer, and to survive during the time of the year when the food was scarcest; they would also rear more young, which would tend to inherit these slight peculiarities. The less scansorial ones would be rigidly destroyed. The consequence would be, that the lions would be transformed into tigers, leopards, or other climbing cats, and would ascend the trees and eat up the men, unless from the *homines* the smaller and lighter individuals were selected, who might have descended along the flexible boughs, as Friday did, when the bear pursued him, and so reached the ground in safety. Then, if there were any terrestrial lions left, the men would stand an equal chance of being devoured; or the scansorial lions might come down at

leisure, modify their organization, and commence the game afresh. The "selective process" would thus bring us precisely to the point whence we started.

Another great feature in Professor Kingsley's work is the extreme liberality with which his scientific opinions are characterized. The contempt which he bestows on the "Cousin Cramchild's arguments" of the anti-scientific school of thinkers, is exemplified by his description of the land of Oldwifesfabledom, where the people were not so frightened as they wish to be; the narrative of Tom's journey to the other end of Nowhere, to attain which he was told to "go to Shiny Wall, and through the white gate that never was opened; and then you will come to Peacepool and Mother Carey's haven, where the good whales go when they die;" and his delightfully minute account of the signification of many things "which nobody will ever hear of, at least until the coming of the Cocqcigrues, when man shall be the measure of all things," contain ideas which we must recommend to the attention of every sincere thinker.

Superficial and limited knowledge is especially visited with Professor Kingsley's severe condemnation. The adventures of the old cock-grouse, who "was always fancying that the end of the world was come when anything happened which was further off than the end of his own nose," and on finding an hour afterwards that the end of the world was not quite come, gravely announced that "it was coming the day after to-morrow," justly parallels the words of the far-seeing writer who, a short time ago, regarded the formation of the Anthropological Society as a sign of the "last days."

The finest passage of the work, however, is the plea for possible degradation of mankind into a perennibranchiate amphibian, *i.e.*, a water baby. We must commend the following argument to M. de Castelnau, who advocates the existence of men with tails in Equatorial America:—"No one has a right to say that no water babies exist, till they have seen no water babies existing, which is quite a different thing, mind, from not seeing water babies, and a thing which nobody ever did, or perhaps ever will do." The argument is certainly a fair specimen of reasoning, and would have been accepted in the middle ages, when men reasoned better and knew less than they do now. After Professor Kingsley has exhausted every argument in favour of the existence of water babies, he triumphantly clenches the matter by telling Cousin Cramchild, his adversary, "that if there are no water babies, at least there ought to be; and that at least he cannot answer."

The whole episode relating to Professor Ptthmllnsprts, the chief professor of necrobioneopalæonthydrochthonanthropopithekology, in the new university which the King of the Cannibal Islands has founded, should be perused by every *savant*, especially by every anthropologist. We must pass it over here, as well as many other brilliant passages. Careful perusal, and a thorough scientific education, are preliminaries to the study of this work, which, like the Gargantua of Rabelais, or the Sueños of Quevedo (especially the latter, in Sir Roger l'Estrange's inimitable translation), inculcates lessons of the highest import in language which must gratify every one who has reflected on the generalizations to which modern science has arrived.

LUNACY AND PHRENOLOGY.*

By C. CARTER BLAKE, Esq., F.G.S., F.A.S.L.

Dr. William Lauder Lindsay, long favourably known as an alienist and as a toxicologist, devoted, in his capacity of physician to James Murray's Asylum for Lunatics, a large proportion of his Annual Report in 1860 to a careful examination of the theories of phrenologists, as tested by the observed cranial development and psychical manifestations of the patients committed to his care. Those who, from previous study of this author's writings, are aware of his sedulous adherence to exactitude, his accuracy of logical deduction, and the wide and prolonged experience which he possesses, will feel no surprise that the work before us is one of the most trenchant and severe attacks on the tenets of phrenologists which has ever appeared. It will, however, we hope, not be our task to wade through the tedious controversy respecting the truth or falsehood of phrenological deductions. Anthropology, in the year 1863, has a more scientific task before it. But a few of the more telling passages of Dr. Lindsay's *brochure* demand our repetition. Before the author proceeds to illustrate, chiefly by means of statistical tables, the bearings of meteorology on psychopathy, *i.e.*, the relationship "between

* Thirty-Third Annual Report of the Directors of James Murray's Royal Asylum for Lunatics, near Perth, June 1860. 8vo. Perth: 1860.

sudden changes in the phases of insanity and certain atmospheric conditions or changes," he states generally adverse conclusions, derived from his observation of the cognate science of phrenology.

As respects some particular organs, Dr. Lindsay's conclusions are as follows:—

"*Benevolence.*—Table I. shows that it was very large in 5 males; very small in no case; large in 72 cases (41 males and 31 females); small in 46 cases (20 males and 26 females). Table II. shows that, of 4 patients who were characterized by excessive liberality of disposition (3 males and 1 female), this organ was large in all; while in 45 patients, chiefly cases of Chronic Dementia, who were characterized by facility of disposition (29 males and 16 females), it was very large or very small in none; large in 20 cases (14 males and 6 females); and small in 16 cases (10 males and 6 females). Table III. shows that, of the 5 patients in whom it was very large the actual character was confirmatory in only *one*. 'In Insanity, Gall states this organ is manifested by excessive liberality and profusion, and by a desire to give away everything of which the individual is possessed. He observes that, in idiocy, it produces good nature and harmlessness; while, where it is small, and Destructiveness large, the unfortunate is prone to fits of rage, and becomes dangerous. . . He does not detail the evidence on which [his observations] proceed, and does not pretend that the cerebral parts, to whose action he attributes the phenomena, were examined or found diseased [!]. The profusion which he attributes to an over action of Benevolence may proceed from general fatuity, from vanity, from small Acquisitiveness and Cautiousness, joined with general prostration of reflecting intellect; in short, from a *thousand* [!] sources, instead of that on which he founds his *conjectures*. We have the more reason to view, with the utmost distrust, Gall's observations upon this subject, when we find that he designated this organ the seat of the faculty of justice and moral obligation. While he does so, he very coolly details a great variety of facts relating to its function, totally at variance with his leading definition.'—[Smith, p. 149]. Here, again, phrenologists are at issue with a vengeance, and their statements are so confused and contradictory, that it need not detain us to say whether or not our statistics bear any of them out.

"*Individuality.*—Smith very properly mentions, as a caution in estimating the size of this organ, that it is the 'chief seat of the frontal sinus in adults' (p. 186). By external manipulation, how much of the size of the 'organ' to refer to the sinus in question [which varies greatly in thickness and extent], and how much to the 'easily distinguished' convolutions of the brain, which are limited to the manifestation of the phenomena of Individuality, it is for phrenologists, and not for us, to indicate!"

The following abstract is given by Dr. Lindsay of his third Table:—

	Number of Cases.	Character of patient apparently confirmatory.	Evidence opposed.	No sufficient evidence.
1. Amativeness	6	4	1	1
2. Philoprogenitiveness	40	13	3	24
3. Concentrativeness	5	2	2	1
4. Inhabitiveness	3	—	2	1
5. Adhesiveness	2	2	—	—
6. Destructiveness	1	—	1	—
7. Alimentiveness and love of life ..	1	—	—	1
8. Acquisitiveness	5	1	—	4
9. Constructiveness	2	2	—	—
10. Self-esteem	5	2	—	3
11. Love of approbation	2	—	—	2
12. Cautiousness	5	2	—	3
13. Benevolence	5	2	2	1
14. Veneration	8	1	—	7
15. Firmness	9	—	2	7
16. Wonder	1	—	—	1
17. Ideality	1	—	—	1
18. Individuality	7	4	—	3
19. Locality	5	1	—	4
20. Time	1	—	—	1
21. Tune	2	—	1	1
22. Causality	1	—	—	1
Total	117	36	14	67
Mean	5·32	1·63	0·63	3·04

The fourth Table is "introduced to meet an objection that may possibly be brought against our statistics, viz., that by isolating the particular 'organs,' and giving results depending on their absolute or actual size, very unfair deductions may be drawn. Accordingly here, in a series of cases, selected on account of their characters presenting certain peculiarities readily recognized and remembered, is given the size of *all* the organs, or at least *all* the more important or more conspicuous and easily measured 'organs;' whereby phrenologists or others may judge for themselves of the relative size or 'development' of the said organ, and of the connection (if any) between such size or development and the actual character of the patients. In *not one* of the 20 cases selected (10 of either sex) did the actual character correspond with what the phrenological examination of the head would have led us to expect."

Some of the instances in this Table are very interesting. We extract a few of the more striking contrasts:—

Phrenological development.	*Observed psychological character.*
1. *Firmness* very large; *Veneration* and *Wit* small	Most inconsistent in his private walk and conversation; affects great sanctity; fond of drollery, especially of the coarse sort; is a good comic actor.

Phrenological development.	*Observed psychological character.*
3. *Constructiveness*, moderate	Was at one time a most ingenious mechanician and accurate draughtsman.
4. *Concentrativeness*, large	Fickle and capricious in his occupations and amusements.
Destructiveness, moderate	Was formerly, when excited during the night, addicted to ringing bells, tearing bed clothes, knocking at doors, smashing windows, and other acts of violence.
Acquisitiveness, large; *Secretiveness*, moderate	Fancies himself possessed of great wealth, which he is disposed to distribute most lavishly.
Time, small	Is an excellent dancer, and has a good ear for time.
5. *Ideality*, small	Most imaginative, telling with the greatest ease and pleasure the most extravagant stories.
7. *Philoprogenitiveness*, very large	Affected by the occasional visits of his wife and children, but never speaks of them during their absence.
8. *Combativeness*, moderate; *Destructiveness*, small	Most pugnacious and vicious when excited.
Alimentiveness, very large	Always fond of a "good feed," but by no means a glutton.
9. *Alimentiveness*, small	Voracity notorious; has a large allowance of food for himself, but is always ready to eat that of his neighbours; is cunning and stealthy, and has more than once managed to escape from his gallery to the private rooms of the officers, and in a few minutes to swallow a meal of several courses, intended for several people; in summer, in addition to large quantities of ordinary food, he loses no opportunity of consuming enormous quantities of grass—in short, he appears able to eat and digest anything, and from similar unusual meals his health has never suffered, he being one of the most healthy men in the Institution.
11. *Philoprogenitiveness*, very large	Has several children, of whom she never speaks, and all remembrance of whom she seems to have lost.
12. *Wit*, small	Fond of coarse drollery; satirical.
15. *Wit*, small	A good mimic; sarcastic; fond of all kinds of coarse drollery.

Dr. Lindsay's fifth Table is of equal value. His conclusions are :—

"That, while the head was *apparently* large in 26 cases, it was *apparently* small in 40. These figures are, however, of little value, unless compared with the actual measurements of the head given in our report for 1858 (pp. 17, et seq.) In regard to *shape*, there are a few noteworthy points, viz.,—that the head was well formed in 39 cases, and narrow laterally in 40. The latter peculiarity does not necessarily imply diminution in size, such heads being generally longer in the antero-posterior diameter. The *forehead* was prominent, high, broad, or square, in 17 cases; low in 32; narrow in 43; sloping or receding in 36. A low, narrow, sloping forehead seems, therefore, to have predominated; but that such a conformational peculiarity does not necessarily indicate deficient mentalization is admitted by some phrenologists themselves, and is, to a certain extent, supported by the comparatively average development of the intellectual faculties, as is shown in the abstract of Table I. The *coronal* region was shallow or flattened in 57 cases, high in 25; the region of the sentiments was, therefore, more than twice as often low as high. It is supposed by some phrenologists 'that when the coronal surface of the cranium is high, the individual is exalted in his morality; and that when the forehead is low, and the skull small he is unreflecting or idiotic.'—[Smith, p. 25.] None of these statements does our experience enable us to corroborate except to a very limited extent. The *occiput* was prominent, broad, or projecting in 43 cases; narrow in 4. On the whole, it was prominent or well marked in the majority of cases. The *basal* region, lastly, or that immediately above the ears, was broad in 28 cases, and narrow in only 1."

His summary of the results of his observations are expressed as follows:—

"The general conclusions, to which our phrenological investigations have led us, are the following:—

"1. That, while there is apparently much truth in Phrenology, especially in regard to some of its general laws or doctrines, there is unquestionably more error.

"2. That, while protuberances or depressions on the skull at the site of what are pointed out by phrenologists as the 'organs' of which the human brain is composed, sometimes co-exist with the manifestation or non-manifestation of the propensities, sentiments, or intellectual powers, ascribed as the functions of such 'organs,' there is, at least, as frequently, and probably more frequently, no confirmatory evidence; or discrepancies or contradictions abound to such an extent, that the exceptions are more numerous than the rules.

"3. That the size or development of the protuberances and depressions—in other words, of the 'organs' above referred to—throws no light on our knowledge of the forms and phases of insanity.

"4. That hence the confident predictions of phrenologists, as to the value of Phrenology in the diagnosis of insanity and the classification of Psychopathies, have not been fulfilled: and

"5. That, on the whole, the reporter is not yet prepared to recommend to his brother Alienists the use of" the phrenological systems.

THE RIVAL RACES; OR, THE SONS OF JOEL.*

We have little doubt that the vast section of the public who glean their minimised historical knowledge from Scott, Ainsworth, or James, who regard *Salathiel* as the medium by which accurate information respecting the early Christian ages may be disseminated, and who rejoice in the perusal of a comic Blackstone, a comic Euclid, and a comic Latin Grammar, will feel much pleasure when they read a veritable anthropological novel. The late Eugène Sue, who had exhausted his skill in the depiction of the incongruities attached to apocryphal French maritime successes, the vices of the *cité*, the tropical swamps of Sumatra, or the subtleties of the Jesuit clergy, when he was satiated with the constant reproduction of scenes of horror, immorality and impossibility, in his last days commenced the novel before us.

The plot is simple. A family of Bretons, the sons of Joel, resident near the classical stones of Karnak, and which, in the ideal mind of Sue, typify the Keltic races of France, are, century after century, encountered by an opponent family, the Nerowegs, of Plouernel, of Frankish (*i.e.*, Teutonic or German) extraction. The wars between the Kelt and the Teuton, the Gaul and the Frank, the aborigen and the invader, range between the years B.C. 57 and A.D. 1849. The events described offer a wide range of variation; they oscillate from the self-immolation of Hena, the virgin of the Island of Sen, who is incremated upon a pile decently and respectfully, as a civilized young lady from Hindustan or Dahomey might be burnt, to the imprisonment of the red Republicans, who had the worst of the conflict at the Paris barricades in June 1848. We believe that our computation is correct when we say, that the amount of rapine and slaughter which is described in this work is unexampled, except on the boards of a melodramatic theatre. It reads like the chronicles of the New England Pilgrim Fathers, who warred against the Indians much in the same manner as the early inhabitants of France, and, unlike the savage Frank, without the excuse of a noble cause, or a truly religious sentiment. Whatever may be said of the amount or nature of the morality which can be inculcated by the perusal of the horrors of traditionary history, M. Sue's work admittedly gives many brilliant pictures of the

* The Rival Races; or the Sons of Joel. A Legendary Romance. By Eugène Sue. 3 vols. 8vo. London: Trübner and Co. 1863.

physical appearance of the natives of early France and Western Germany. The following description closely resembles that of the warriors of Equatorial Africa; it is that of Riowag, chief of the Rhenish Franks:—

"I knew, indeed, that the Franks often took off the skins of their prisoners with great dexterity, and that the chiefs of the hordes wore these as triumphal ornaments. The proposition of the flayer was received with cries of joy; those who held me bound, sought for a suitable place for my torture, while the others sharpened their knives upon the rocks. Suddenly the chief of these flayers approached me slowly; he was horrible to look upon; a tattooed circle of bright red surrounded his eyes and striped his cheeks; they looked like bleeding gashes upon that blackened face. His hair, knotted at the top of his head, in the Frank fashion, fell down over his shoulders like the mane of a helmet, and was of a copperish colour; round his neck and wrists he wore necklaces of tin; his dress was a cloak of black sheep-skin; his legs and thighs were also wrapped in sheep-skins, bound with crossed skin bands. By his side hung a sword and a long knife."

It must be recollected that M. Sue was a Gaul, and that the amount of vilification to which our collateral relations, the unfortunate Franks, are exposed throughout his work, is something fearful. We recollect that we were once told by the chief diplomatic representative of a Barbary power, that the "battle of Waterloo was a naval battle, in which the French beat the English;" and with M. Thiers' account of that battle before our eyes, we feel little surprise at the ingenuity by which M. Sue tries to disguise the fact, that the Teuton and Scandinavian races, whenever opposed to the Kelts or Bretons, in fair fight, vanquished them; the result being caused, we believe, as anthropologists, by the superior physical stamina of the North-eastern race.

"This immense but disorderly camp, was a gigantic and savage town; here and there were their chariots of war, hidden by entrenchments, constructed of earth, and strengthened by trunks of trees; according to the usage of these savages, their untiring lean little horses, with rough and shaggy hides, having a halter of rope for their bridles, were tethered to the chariot wheels, or trees, of which they gnawed the bark. The Franks, clothed in skins of beasts, their beards and hair greasy with tallow, looked stupid and ferocious as well; some lay stretched in the hot rays of the sun, which they had come to seek from the depths of their dark and icy forests; others found amusement in hunting vermin upon their hairy bodies; for these barbarians wallowed in such filth, that although they were encamped in the open air, a foul infectious stench hung about their neighbourhood.

"At the sight of these undisciplined hordes, innumerable but ill-armed, recruited continually by new tribes emigrating in masses from the icy lands of the North to burst upon our fertile and smiling Gaul

as upon a prey, I remembered, despite of myself, some words of sinister prediction which had escaped Victoria; but soon I held in great contempt, these barbarians, who, three or four times superior in number to our army, had never been able, during several years, and despite of bloody battles, to effect any settlement upon our soil.

"As I passed, carried upon the shoulders of the four black warriors, I was pursued by curses, threats, and cries by the Franks. Several times my escort was obliged to use its arms to prevent my being massacred. I remarked a larger and more carefully constructed hut than the rest, before which flaunted a yellow and red flag. A great number of horsemen clad in bear's skins, some in the saddle, some on foot and leaning on their lances, posted around that habitation, showed that one of the chiefs of these hordes occupied it. I again begged Riowag, who walked beside me, ever grave and silent, to conduct me first to the chief whose banner I perceived, after which they might kill me; my request was in vain, and we entered a green wood, and at last reached the centre of a great glade. At some distance I noticed a natural grotto, formed of great blocks of grey rock, between which, here and there, tall firs and chestnuts grew; a spring of water, running over the rocks, fell into a sort of natural basin. Not far from this cavern, stood a narrow vessel of brass, about the length of a man; a net of iron chains covered this infernal cauldron. Four great stones supported this vessel, beneath which was heaped a quantity of brushwood and logs; whitened human bones, scattered on the ground, gave the glade the appearance of a place of slaughter. In the centre of the glade arose a colossal statue with three shapeless heads, roughly hewn in the trunk of an enormous tree."

When, however, M. Sue attempts to describe his own supposed ancestors, the Gauls, he does not exhibit the same minute fidelity of description. Their physical characters are passed over without a word. As regards their dwelling houses, M. Sue, on authority of Thierry, Dom Bouquet, Herodian, Vitruvius, and Strabo, thus describes them:—

"The house of Joel, like all rural habitations, was very spacious, of round form, and constructed by means of two ranges of hurdles, between which was well beaten clay, mixed with chopped straw; then the outside of this thick wall was plastered with a coat of fine, fat earth, which, in drying, had become as hard as stone; the roof, large and overhanging, formed of rafters of oak joined together, was covered with a layer of seaweed, too thick for the water to penetrate. On each side of the house extended buildings destined for the harvest, stables, sheep-folds, cellars, and wash-houses. These several buildings, forming an oblong square, enclosed a large court, shut up, during the night, by a massive door. Outside, a strong palisade, planted behind a deep ditch, surrounded the building, leaving behind them and it a sort of lane all round, some four cubits broad. In this, two large and very savage war-dogs were let loose every night. To this

palisade there was an exterior gate, corresponding to the interior gate of the court. Every place was closed at nightfall.

"The number of men, women and children, all more or less related to Joel, who assisted him in farming, was considerable. They lived in buildings dependent on the principal house, where they assembled at noon and evening, to take their meals in common.

"Other habitations thus constructed, and occupied by numerous inhabitants, whom their lands maintained, were dispersed here and there throughout the country, and composed the *lignez*, or tribe of Karnak, of which Joel had been elected chief."

Many amusing anecdotes are related of the manners and customs of the Gauls, none of which, however, rest on the statements of contemporary history. The only conclusion at which we can arrive is that they were a set of wretched savages; and we think that the conquests which extirpated the Gaul to introduce the Frank, like those which destroyed the Briton to make room for the Saxon, were of the greatest benefit to humanity. The philosophy of Charles Darwin is most sound on this point. That the extirpation of the lower race should be the immediate cause of "the most exalted object which we are capable of conceiving, namely, the production of the higher animals,"* is a sound biological generalization. The historical event, that the autochthonous Gaulish race has been nearly "improved off" the face of the earth, we consider to have been conducive to the well-being of Western Europe. Now that such ideas as these are no longer confined to anthropologists, but are uttered by the politician, we have no doubt that such amusing and instructive works as that of M. Sue will be diligently perused, so long as they faithfully depict the struggles of a nation to attain an impracticable liberty, or the futile efforts of a doomed race to maintain its position in the ethnic scale.

RAMSAY ON GEOLOGY AND ANTHROPOLOGY.†

Professor Ramsay's lectures, amongst the geologists for which they were destined, will inevitably receive the support they so eminently deserve. We believe that the whole work, and especially the

* Darwin, Origin of Species, 1st edition, p. 489.

† The Physical Geology and Geography of Great Britain; a Course of Six Lectures delivered to Working Men in the Museum of Practical Geology, Jermyn Street. By Professor A. C. Ramsay, F.R.S., President of the Geological Society. 8vo. London: Stanford. 1863.

second lecture, which treats of metamorphism and contortions of strata, may be indicated as a model series of elementary lectures, in which the author has adhered to the strict paths of logical science, while, by a charm of language, a lucidity of style, and a prudent abnegation of all unproven and unproveable hypotheses, Professor Ramsay has added new laurels to his geological fame. Scientific men will sooner or later learn that the "rapid and right" progress of truth is best advanced, not by the proposition of chimerical hypotheses, or vague speculations, but by the diffusion of accurate and positive facts, inductively ascertained, amongst the thinking world. However tempting it may be to discuss Professor Ramsay's geological facts, we must pass them over in the attempt to answer the broad question, "What is the bearing of this work on anthropological science?"

After Professor Ramsay has discussed, in his sixth lecture, the more striking effects of the physical geology of the country on population and industry, the following passage occurs:—

"I would now wish to say a few words on the influence of geology upon the inhabitants of different parts of our island.

"Great Britain is inhabited by two or three great races, more or less intermingled with one another. It requires but a cursory examination to see that the barren districts, as a whole, are inhabited by two branches of one race, distinct from each other, and yet alike, while the more fertile parts are occupied by one or two other races. Thus the north of Scotland, beyond the great valley, is, as every one knows, chiefly inhabited by the Celtic Highlanders. On the east, along the coasts of the Moray Forth, Caithness, and in the Orkney and Shetland Islands, the people are of Scandinavian origin and speak Scotch, thus standing out in marked contrast from the Gaelic clans, who possess the wilder and higher grounds in the interior and western districts. There is here a curious relation of the human population to the geological character of the country. The Scandinavian element is strongly developed along the maritime tracts, which, being chiefly composed of Old Red Sandstone, stretch away in long and fertile lowlands, while the Celts are pretty closely restricted to the higher and bleaker tracts where the barren gneissic and schistose rocks prevail.

"From an early period it appears that on both sides of the Channel, the Continent of Europe, and what is now Great Britain, were inhabited by a Celtic population, known to us in our history by the name of the Cimri, whom we call Welsh, or the ancient Britons. Further north another Celtic people, whom we know as the Gaels, inhabited the greater part of what is now termed Scotland, and, I believe, the whole of Ireland. Which of these two Celtic races is most ancient in our islands we seem unable clearly to make out; there are a great many theories on the subject, but I do not think it has been proved to demonstration that one of them is later than the

other. It is not improbable, however, that the Highlanders, who are now largely intermixed with a deal of Scandinavian blood, once spread further south than what is considered the southern borders of the Highlands, and were forced to retire northwards into their mountains, through the superior power of another Celtic population that worked its way northwards from the more fertile districts of England and south of Scotland, for no race would willingly inhabit an area composed of barren mountains if it could take up a position on more fertile lands. A great number of the names of places in the centre and south of Scotland are not Gaelic, but names that can be translated by any one who has even a comparatively superficial knowledge of Welsh, such as I happen to possess. It is therefore probable that the southern and midland parts were inhabited in old times by the same race of people that now inhabit the extreme west of England, or Wales. And to a certain extent this is proved by the ancient British literature. I use the word British as applied to Welsh literature. But however this may be, it is certain that the Britons or the Welsh tribe of Celts overspread at one time (when the Romans invaded our country) the whole of the southern part of Great Britain; by and bye, after the Roman invasion, they mixed with their conquerors, but the Romans, as far as blood is concerned, seemed to have played but a very unimportant part in our country. They may have intermarried to some extent with the natives, but they occupied our country very much in the manner that we now occupy India. Coming here as military colonists, they went away again as soon as their time of service was up and left the country altogether. But after the retirement of the Romans, invasions took place by the Danes, the Scandinavian tribes, the Anglo-Saxons and others who came in to occupy the country permanently. Then the native tribes, dispossessed of their territories and driven westwards, retreated into the interior and higher parts of the country. Their remains are still extant in Devon and Cornwall, where there is a tolerably pure Celtic race, and among the Welsh mountains where the same Celtic element is still to a great extent free from admixture. They were driven back into the mountainous regions, whither it was not worth the while of their pursuers to follow them, in order to dispossess them of those barren tracts. Thus it happens that the oldest tribes now inhabiting our country are to be found among the old palæozoic mountains, which, composed of the most ancient of our geological formations, and rising up into the highest grounds, must have been the first parts of the British islands to rise above the waters, during the last elevation of the land."

The coincidence between the geological formation and the ethnic differences is at least remarkable. There was, however, a time when the Keltic races stretched over the mesozoic and cainozoic formations of Eastern England, when the present ethnic outliers of the Hebrides, Western Scotland, Man, Wales, and Cornwall, were all connected into one kindred population speaking a Keltic language. "Denuda-

tion" and "erosive action" have, however, rendered them a scattered people, while the mesozoic and cainozoic formations are filled with the modified and mixed descendants of the Jute and the Saxon.

We hope that at some future time Professor Ramsay may work out the problems contained in his sixth chapter more in detail. He concludes in the following words:—

"When we come to consider the nature of the population inhabiting our island, we find it also to be greatly influenced by this old geology. The aboriginal tribes have been driven into the more barren mountain regions in the north and west, and so remain to this day—speaking to a great extent their aboriginal languages, but gradually melting up with the great mass of mixed races that came in with later waves of conquest from other parts of Europe. These later races settling down in the more fertile parts of the country, began to develop its agricultural resources. In later times they have applied themselves with wonderful energy to turn to use the vast stores of mineral wealth which lie in the central districts. Hence have arisen those densely peopled towns and villages where the manufactures of the country are carried on. Yet in the west, too—in Devon, and Cornwall, and in Wales, where the great slate regions are—there are busy centres of population, where the mineral products are worked by the aboriginal inhabitants of Celtic origin.

"It is interesting to go back a little and inquire what may have been the condition of our country when man first set foot upon its surface. We know that these islands of ours have been frequently united to the continent, and as frequently disunited, partly by elevations and depressions of the land, and to a great extent, also, by denudations. When the earliest human population reached their plains, they were probably united to the continent. Such is the deliberate opinion of some of our best geologists. They do not assert it as a positive fact, but they consider it probable that these old prehistoric men inhabited our country along with the great hairy mammoth, the rhinoceros, the cave bear, the lion, and the hippopotamus,—that they travelled westwards from the Continent of Europe, along with these extinct mammalia, over that continuation of the land which originally united Great Britain to the Continent. But in later times denudations and alterations of level have taken place, chiefly, I believe, great denudations of the chalk, and of the strata that cover the chalk, and then our island has become disunited from the mainland. And now, with all its numerous inlets, its great extent of coast, its admirable harbours, our country lies within the direct influence of the Gulf Stream, which influences the whole climate of the west of Europe, and we, a mixed race of people, Celt, Scandinavian, Saxon, Norman, more or less intermingled in blood, are so happily placed that, in a great measure, we have the command of the commerce of Europe, and send out our fleets of merchandise from every port. We are happy, in my opinion, above all things in this, that by denudation we have been dissevered from the Continent of Europe,

for thus it happens that, uninfluenced by the immediate contact of hostile countries, and almost unbiassed by the influence of peoples of foreign blood, during the long course of years in which our country has never seen the foot of an invader, we have been enabled so to develope our own ideas of right and wrong, of political freedom, and of political morality, that we now stand here, the freest country on the face of the globe, enjoying our privileges, under the strongest and freest Government in the living world."

BARUCH SPINOZA.*

MUCH of the scope of the present work is theological, and the principles on which the *Anthropological Review* is conducted preclude the discussion of theological subjects. The *Tractatus Theologico-Politicus*, however, contains much valuable information respecting purely scientific topics which have, since Baruch Spinoza gave to the world those profound works which will be for ever associated with his name, become even popular. As the learned and anonymous editor of the *Tractatus* observes:—

"The Hindus preceded the Hebrews in civilization by hundreds, perhaps by thousands of years, and in their Vedas, which existed in writing centuries before the Jews became serfs to Egyptian task-masters, they have not only given us a clear insight into their religious world, but have actually transmitted the record of this in the tongue which is the root of all the dialects spoken in Europe to the present day. It might have been that the Sanscrit Vedas had descended to us as our especial religious inheritance, when we should have had Brahm, Vichnou, and Siva as our triune divinity. The Zends, again, the religious books of the ancient Persians, are of great antiquity, and, as the Persians were nearer neighbours of the Jews than the Hindus, so do we find that they have influenced Jewish ideas in a much greater measure."

Much credit is due to the editor, and especially to the publishers, who have produced this valuable work in a compendious form and at a cheap price. Many readers will gladly peruse it, if only to study the thoughts of an author whose terse and vigorous style has raised him for the last two hundred years to the position of the best-abused author in philosophy. We would very much like to see the *Ethica* of the same author published in the same manner as the present volume.

* Tractatus Theologico-Politicus; a Critical Inquiry into the History, Purpose, and Authenticity of the Hebrew Scriptures: with the right to free thought and free discussion asserted, and shewn to be not only consistent, but necessarily bound up with true piety and good government. By Benedict de Spinoza. From the Latin; with an Introduction and Notes by the Editor. 8vo. London: Trübner and Co. 1862.

ANTHROPOLOGY IN THE NURSERY.*

MANY of the errors which pervade the educated classes of society are due to the diffusion amongst them, while their memories are strong, and before their understanding is matured, of statements contained in the school books forced upon their infant comprehension, which, although wholly at variance with known facts, become articles of compulsory belief for their acceptance. In the above little book, which we especially select as the most complete, as well as the most exact elementary geographical compendium in our language, the English public, which is always prone to view cheap literature with too favourable eyes, will find some exceedingly puzzling statements respecting the races of men. The author of this school compilation says, "man is adapted to live in all climates excepting those of extreme cold." We need not tell our readers that this is the reverse of the fact, and that man cannot live (and thrive) in all climates. We know not what idea of "adaptation" the child who reads this statement is expected to possess; but the simple fact that the Europeans in Bengal die out in the third generation, contravenes the assumption of the cosmopolitanist. But the most wonderful statement which we remember perusing since the days of Gulliver, is that "the original people of Australia are considered of the same race with the Hottentots of South Africa." This is indeed an original theory; and is nearly on the same mental level as the statement which we heard an African traveller make a few months ago in a semi-scientific audience, that the Hottentots were a mixed race produced between the Dutch and the natives of the Cape settlement. England is possibly the only country in Europe where such a statement could have been made, and we regard such exhibitions as most detrimental, not only to anthropology, but to general education, as it presupposed an amount of ignorance respecting the early colonization of the Cape Colony of which we can only find adequate precedents in the infant school. The time will shortly come when the legitimate desire of the people to give to their children scientific text-books really worth reading may be gratified, and when the teachers who disdain to impart sound elementary knowledge, on the selfish plea, *illos vero indignos puto, quibus rationem reddam*, will find that they no longer address an attentive, or a remunerative audience.

* Geographical Primer (Chambers' Educational Course). 12mo. London and Edinburgh: William and Robert Chambers.

Miscellanea Anthropologica.

Acts xvii, 26. A correspondent sends us the following:—I send you a list, and value, with respect to date, of the authorities for omitting and retaining ἀιματος in the text of Acts xvii, 26. Alford believes the weight of evidence to be in favour of ἀιματος, and retains it in the text.

ἀιματος

OMITTED IN

Codex Alexandrinus - -	v cent.	Uncial MS.
„ Vaticanus - - -	iv cent.	„
„ Regius - - -	xi cent.	Cursive MS.
„ Coistinianus - -	xi cent.	„
„ Harleianus - -	xv cent.	„
„ Genevencis - -	xi cent.	„
„ Alexandro-Vaticanus -	xi cent.	„
„ Venetianus - -	xi cent.	„
Version Vulgate - - -	iv cent.	
„ Coptic - - -	iii cent.	
„ Sahidic - - -	iii cent.	
„ Æthiopic (which join together εποι. εξ ενος and και ταπαντα)	iv cent.	
Author Clement - - -	ii cent.	
„ Bede - - -	viii cent.	

INSERTED IN

Codex Bezæ - -	v or vi cent.	Uncial MS.
„ Laudianus - -	vi or vii cent.	„
„ Angelicus Romanus - -	ix cent.	„
„ Mutinensis - -	ix cent.	„
Most of the Cursive MS.		
Greek Codex, cited in Bede's Commentary - -	vii cent.	„
Version Peschito-Syriac - -	ii cent.	
„ Philoxenian Syriac and other versions - -	vi cent.	
Author Irenæus - - -	ii cent.	
„ Theodoretus of Cyrus of Syria (twice) - -	v cent.	
„ Chrysostom (often) - -	iv cent.	
„ Cosmus Indicopleustes -	xi cent.	
„ Theophylact, Archbp. of Bulgaria	xi cent.	
„ Œcumenicus of Tricca -	xi cent.	

"Meyer (Dr. H. A. W.) well remarks on the omission that it is more likely to have happened owing to ενος ἀιματος than that ἀιματος

should be a gloss on *ενος*,—for that this would be rather given by *ανθρωπον*." Alford.

N.B. As a rule, the Uncial, are of greater value than the Cursive MSS.

Superstitions of Nations. Mr. HALIBURTON, Vice-president of the Nova Scotia Institute, has been lecturing at Halifax, N.S., on a comparison of the customs and superstitions of nations, as affording evidences of the unity of origin of the human race.

In all ages and in all countries, a sneeze is supposed to be an omen of impending evil to the person who sneezes, or to an undertaking which he may at the time be commencing, and an invocation of the Deity is requisite to protect the sneezer from the danger he incurs. Among the ancients, Homer mentions it. Aristotle fruitlessly endeavours to explain its existence; Apuleius refers to it; and Pliny has a problem on it: "Cur sternutantes salutantur." Tiberius observed it, and rigidly exacted the custom of protecting the person who sneezed, by an ejaculation to the gods. The Jewish Rabbis were equally puzzled to account for its existence among the Hebrews, who to this day exclaim "Tobim Chaim" (a long life to you) on such occasions.

But the custom is also met with in the most remote parts of Asia, among the most secluded nations of Africa, and in many tribes of the New World. De Soto, in his wanderings in Florida (which country he discovered), noticed that when a Sachem sneezed, the savages around him bowed down, and invoked the sun to save him. In Otaheite, it is the custom to invoke the protection of Heaven, when a person sneezes. Mariner relates the like of the natives of Fiji, and of the Tonga group.

Mr. Haliburton considers that these remarkable identities in the observance of so irrational a custom took their rise from the religious fears and superstitions of primitive man, the common parent of all these widely-scattered tribes; and he regards it as a strong proof of the unity of the human race. Let anthropologists answer the question, how else did all men, in all countries, arrive at the same singular conclusion, as to the mysterious dangers attendant on a sneeze, if this belief was not inherited from a common source?

Among Celtic tribes (as, for example, in the superstition of the Highlanders) the influence of the fairies is the danger to which the sneezer is exposed, and minor spirits of an analogous grade are those guarded against by the invocations of the Polynesian savage.

Proposed Exploration of Peru. (Extract of a letter from Professor Raimondi, Lima, 13th July, 1863, to William Bollaert, Esq., London). "Accept my thanks for the trouble you have taken to translate for the society from my work on Loreto, what appertains to anthropology. The work in question is but a small specimen of the materials I am getting together for my large work on Peru, which will amount to at least twenty thick volumes, and will take up the whole of my lifetime to complete.

"Since I had the pleasure of exploring with you the province of Tarapacá in 1855, I have not ceased to wander over this interesting

country, collecting precious materials connected with geography, meteorology, anthropology, mineralogy, geology, zoology, and botany.

"Such is the abundance of materials already collected, that I fear I shall never be spared to finish my explorations, and publish my labours. I have the idea to divide my work into separate portions. The first to be the geographical, including meteorology, and all I have been able to collect about the different races which now occupy Peru, particularly as to their origin. I have a great number of crania for this object, of the people who inhabited Peru before the conquest. The second part will embrace mineralogy; the third, geology; the fourth, botany; the fifth, zoology.

"I have still to explore for the next four years, so as to complete my studies. The publication of my great work cannot take place for some years; but I will from time to time publish short memoirs, which I shall send you copies of, so that you may distribute to the learned societies of England.

"I am now starting from Lima for the interior, a journey of eighteen months. I go to Callao; then to Pisco, by sea; then to Ica, where I have my animals awaiting me: then onwards to Arequipa. Here I shall remain a month, so as to examine the mineral waters in the vicinity; also to explore the volcano of Misti (Arequipa). Then to Moquegua and Tacna. Then I shall ascend to the table-land of Titicaca, and go all round the great lake analysing the waters. From Puna I intend to enter the tropical forests of Caravaya, where I shall be two or three months, so as to study with care the Chinchonas and the gold washings. Then I go to Cuzco, to examine its country, returning to Lima by another route.

"If you like you can make this, my projected exploration, known to the learned societies in England, and I shall be glad to receive any views of theirs, and be glad to attend to their instructions. I shall be in Arequipa until October. Address to me, care of Dr. Miguel, Colunga School of Medicine, Lima."

*Mental Calculation.** All the performances of Colborn, Buxton, and other celebrated calculators, appear insignificant when compared with those of our contemporary, Zacharias Dase, of Hamburg. Having had ample opportunities to witness his extraordinary performances, I shall first describe what took place on the 12th, 15th, and 19th of January, and subsequently add what I have observed in my daily personal intercourse with him.

Dase commenced by casting a rapid glance on twelve ciphers written by a spectator on a board, and reciting them forwards or backwards. He then invited any person to multiply the number with any single number, and immediately named the multiplicator on the product being communicated to him.

At the third representation, Dase recited 188 ciphers, forwards and backwards, stating at the same time how often and at what place each number occurred. I subjoin a few of the questions and answers.

* Versuch einer Wissenschaftlichen Begründung der Psychologie. Von Professor Dr. P. Jessen. Berlin: 1865.

Q. What is the product of 354783293 multiplied by 5423957? *A.* ($1\frac{1}{2}$ minutes) 1924329325550401.

Q. What is the product of 6529710840352 divided by 98? *A.* (instantaneously) 66629710840352.

Q. 684028396281753, divide by 6541325. *A.* ($2\frac{1}{2}$ minutes) $104570312\ \frac{138353}{654132525}$.

Q. Divide 423339075240048565 by 708346795. *A.* (after five minutes) 597643807.

Q. Tell the square root of 582169. *A.* (immediately) 763.

Q. What is the cubic root of 318611987? *A.* 683.

Q. Tell the 19th root of 709358536994593225619542902846440442 3 *A.* (after three minutes) 87.

Q. The steeple of the Nicolay Church being 180 feet high, how many such steeples must be towered upon each other before the last reaches the moon, assuming the distance to be 50,000 German miles? *A.* (immediately) 6666666 and two-thirds.

Q. What time would a snail require to perform this journey, assuming that it covers two inches and three-sevenths in a minute? *A.* (after a few minutes) 5929411764 $\frac{2}{17}$ minutes; 98823529 $\frac{7}{17}$ hours; 4117647 $\frac{1}{17}$ days; or, 11281 years and 82 $\frac{1}{17}$ days.

At the end of his representations, Dase gave some specimens of what he calls his "surveying glance." Thus, he mentioned at once the number of a handful of peas or beans, the number of books on the shelves, or the pieces in a bundle of firewood without a moment's hesitation. If ever he commits an error, he instantly corrected it. Thus, he estimated the number of a handful of peas to be 242, but he immediately corrected it by saying that he had probably counted two peas twice.

The most difficult tasks which Dase performed were the extraction of the 52nd root of a number of 97 ciphers, and the multiplication of two sums, each consisting of 100 ciphers, which he accomplished at Munich, in $8\frac{3}{4}$ hours.

He stated that during this calculation, the conversation of the spectators rather entertained him, and that neither noise nor loud conversation disturbed him in the least.

On my questioning him how far he thought he might go in multiplication of sums, he replied that he could not tell, but he had no hesitation in saying that he could undertake the multiplication of sums of 300 ciphers, and might probably require 100 hours mentally to accomplish the task.

From the experiments it resulted that he solved the multiplication of 8 ciphers in $\frac{3}{4}$ of a minute; 12 in $2\frac{1}{4}$ minutes; 20 in 6-8 minutes; 40 in 40 minutes; 60 in 3 hours; 100 in $8\frac{3}{4}$ hours.

Zacharias Dase, the son of a publican, was born at Hamburg, June 23, 1824. He was sent to an infant school at the age of two and a-half years, and entered a popular school in his sixth year. Up to his fifteenth year he received instruction in reading, arithmetic, writing, geography, history, and the German language. He was always the first in arithmetic, nor was there any book published on

this subject in Hamburg which he had not studied through. He says of himself:—"Originally I occupied myself more with written than with mental calculation, and I am therefore justified in asserting that, though my calculating capacity may be innate, it has been developed by undeviating industry. My mind never becomes fatigued by calculations. I may continue them for the whole day and am as fresh to begin again in the evening." From his early childhood Dase suffered from a spasmodic affection of the stomach, and epileptic attacks. Speaking of his moral character, he says:—"I am not passionate nor sensual; I am indifferent to the fair sex; I avoid spirituous liquors; I am good natured, tolerant, companionable, a man of peace, and make no distinction in my intercourse with my fellow beings, whether they be of high rank or not; I am fond of children, and am rather economical." With regard to his mental faculties, he complains that he could make no great progress in mathematics, that he had no memory for form and space. Nor did he make much progress in the highest branches of arithmetic, his great skill being limited to the extraction of roots, the calculation of factors and logarithms. He could give no exact account of the process by which he arrived at his results; but he seems to proceed in his mental calculations as if he were performing them on paper or a slate. In multiplying, all the numbers are plainly visible to him; he multiplies the multiplicands successively with the multiplicator, placing the sums mentally beneath each other. He further states that besides this capacity for number, he possesses order and locality in an eminent degree, so that in large towns he soon finds his way. He complains of possessing neither the faculty of ambition nor wit, but, on the other hand, much patience.

Man and the Gorilla.—As the work by Professor Owen (*Catalogue of the Osteological Collection in the College of Surgeons.* 4to. Lond. 1853) may not be accessible to all our readers, we make no excuse for reprinting the following excerpt, in the present state of our knowledge of the subject:—

"The chief differences which the cranium and teeth of the Tr. gorilla present, as compared with those parts of the human structure, may be summed up as follows:—1. The smaller proportionate size of the cranium; 2. The more backward position of the foramen magnum, and its more oblique plane in relation to the base of the skull, 3. The smaller relative size, and more backward position of the occipital condyles; 4. The longer basioccipital, and broader, flatter, and lower superoccipital; 5. The longer basisphenoid, and shorter alisphenoids; 6. The smaller size of the coalesced parietals; and their separation from the alisphenoids; 7. The conversion of a greater part of the outer surface of the parietals into concavities or depressions for the lodgment of the temporal muscles, by reason of the bony crest developed from the line of the obliterated sagittal suture and of the lambdoidal crest; 8. The larger proportion of this crest and of the squamosal plate developed from the mastoid, and the smaller size of the proper mastoid process; 9. The smaller size of the vaginal

and styliform processses, and the absence of the styloid process, arising from the non-anchylosis of the stylohyal bone; 10. The larger post glenoid process and the longer auditory process (tympanic bone,) with their relative position, one behind, but not below the other; 11. The position of the stronger zygomata opposite the middle third of the basis cranii; 12. The prominent superorbital ridge; 13. The longer nasal bones, anchylosed together, and flattened at their lower half; 14. The greater proportional size, and greater prominence of the upper and lower jaws; 15. The longer osseous palate, and the median emargination of its posterior border; 16. The parallelism of the alveoli of the molars and canine of one side with those of the other; 17. The diastema or vacant place in front of the socket of the canine in the upper jaw, and behind that socket in the lower jaw; 18. The large and more produced premaxillaries; the persistence of more or less of their sutures, showing the intervention of their upper extremities between the nasal and maxillary bones; 19. The minor extent of the connexion of the lacrymal with the "pars plana" of the æthmoid, or their separation by the junction of the orbital plate of the maxillary with that of the frontal behind the lacrymal; 20. The greater depth of the rhinencephalic fossa, and the absence or rudimental state of the crista galli; 21. The squamosal, lambdoidal, alisphenoidal, and pterygoid air-cells; 22. The more prominent cusps of the molar teeth; 23. The larger relative size, and more complex grinding surface, of the last molar tooth in both jaws: 24. The larger relative size of the premolars, especially of the first; 25. The more complex implantation of the premolars by three roots, two external, and one internal; 26. The much larger and longer canines; 27. The sexual distinction in the development of these teeth; 28. The more sloping position of the crowns of the incisors; 29. The broader and higher ascending ramus of the lower jaw; 30. The total absence of the prominence of the symphysis forming the chin."

Extracts from "Zeitschrift für Völkerpsychologie", by Drs. Lazarus and Steinthal. Berlin, 1859. (*Journal for National Psychology.*)—Introduction. . . . . Anthropological-physiological and climatal conditions, however much they may contribute towards the explanation of a national character, can never sufficiently explain the psychical state of a nation. . . .

Ethnology, as it has been hitherto treated, may be termed a chapter of zoology, for its object is, properly speaking, man considered as an animal, a natural product, independent of his mental development, merely according to his physical structure and his diversities as they are found conditioned by soil and climate. There are also taken into consideration the descent and relations of nations, their intermixture and migrations.

But man is by nature more than an animal. Man is a spiritual animal, with innate mental dispositions, inclinations, feelings, independent of his spiritual development in history. Man must also be considered in this aspect. Ethnology would, thus treated, not actually

abandon zoology; we would only add psychical ethnology to physical ethnology. Its object is to fathom the specific mental activity of the various minds, in as far as they form the psychical nature of nations. . . .

Franklin's definition, "Man is a tool-making animal," is, both theoretically and practically, important. New forces are imparted beyond those given by nature, whilst animals are confined to them. And the instrument and its products re-act on the mind, stimulating its inventive powers. Not less important is it that man can invent spiritual instruments. Rules, laws, and schemes are formed to arrange the perceptions. . . .

The metaphysical dispute, whether the history of the human species commences with a gradual progress or decay, does not concern us. Science cannot take into account the mythical suppositions of a destroyed antediluvian civilization; it must attempt to elucidate the development of humanity from historical facts, and the mental condition of mankind as it manifests itself at present.

To the Editor of the "Anthropological Review."—Sir,—At page 186 in the report of the discussion before the Anthropological Society* it is stated, that Mr. Bollaert mentioned a case of a number of Negroes being kidnapped and carried to Easter Island, where they rapidly died out of dysentery and measles.

What I said was, that a number of the aboriginal (say Polynesian) inhabitants of Easter Island (between 75° 5′ and 75° 12′ south latitude, and between 109° and 110° west longitude) had been kidnapped and taken to Peru, with the intention of making labourers of them. They could, or they would not, be taught to work. The Indian generally is not a working individual, and, consequent on the change of climate and food, many had died of dysentery and measles.

I may add, that kidnapping of natives from some of the Polynesian islands had been perpetrated, and they had been taken to Peru as labourers. However, the native and French authorities in those seas put a stop at once to this nefarious proceeding, as did also the Peruvian government.

At page 191 of same report the following may be added to my observations relative to Jewish blood in New Granada:—Not long after the discovery of America, some two hundred Jewish families having had Romanism thrust upon them in Spain, emigrated to Antioquia, in the interior of New Granada. Here Spaniards, Israelites, and Criollos mixed freely, producing, according to Samper, a New Granadian writer, "the most beautiful and energetic Mestizo-European race known in Spanish America. At present the state of Antioquia contains more than 300,000 inhabitants: of these 250,000 correspond to this mixed race, in which figures the Jewish element."

London, May 2, 1863. W. Bollaert.

* We insert Mr. Bollaert's note, but take the opportunity of observing that we do not hold ourselves in any way responsible for the contents of the Journal of the Society, just as the Anthropological Society is in no way responsible for the contents of the Review. Ed.

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